Vol. 931 Number 1

OFFICIAL GAZETTE

of the

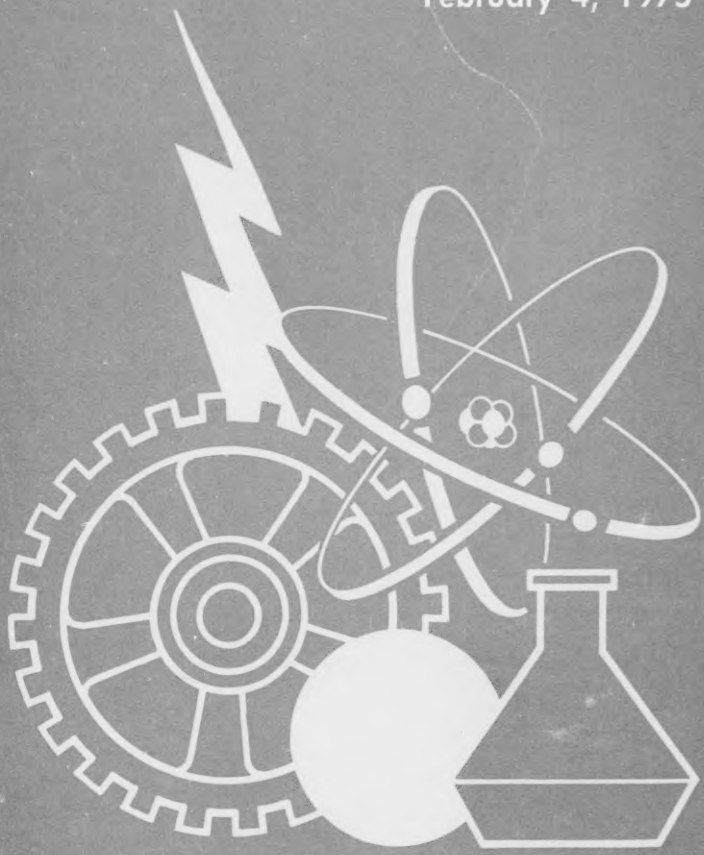
UNITED STATES PATENT AND TRADEMARK OFFICE

ARMCO OIL CO
FEB 10 1975

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

February 4, 1975



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

February 4, 1975 Volume 931 Number 1

FEB 3 0 1975

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PATENT OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of December 1974

Examiner affirmed	195
Examiner affirmed in part	25
Examiner reversed	64
Total	284

National Inventors Day

The Patent and Trademark Office will be observing National Inventors Day in the Public Search Room on Saturday and Sunday, February 8 and 9, 1975, between the hours of 1:00 p.m. and 5:00 p.m. The public is invited to view the exhibits on these days and to attend a formal program at 2:00 p.m. on Sunday.

In order to accommodate the exhibits, it will be necessary to close the Public Search Room at 5:00 p.m. on Friday, February 7, 1975.

We would appreciate the cooperation of all users of the Search Room facilities in removing all personal items and belongings in order to permit the early closing time.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Availability of U.S. Patent Reclassification Microfilm

The Patent Office announces the availability of its new microfilm publication "Reclassification Transfer Records."

This official record lists all the Original and Cross-reference Patent classification changes which occur in a reclassification project. This publication begins with the December 1973, reclassification and will be available for all subsequent reclassification projects.

The film is available as separately listed Original and Cross-reference transaction records in three sequences, from old classification to new, in (1) new class/subclass order, (2) Patent number order and (3) old class/subclass order.

The entire publication for December 1973 (Reclassification Order #413) consists of 3 reels of 16mm negative microfilm. This set is available as follows:

Form of Microfilm	Accession No.	Price
Plain 16 mm Film Reel	COM-74-11750-P	$14.00 Domestic 22.00 Foreign
Recordak Cartridge	COM-74-11750-R	20.00 Domestic 28.00 Foreign
3M Cartridge	COM-74-11750-M	20.00 Domestic 28.00 Foreign
Thread Easy	COM-74-11750-T	20.00 Domestic 28.00 Foreign

Also available at this time is the *March 1974* reclassification publication (Reclassification Order #414), of 2 reels of 16mm negative microfilm. This film is available as follows:

Form of Microfilm	Accession No.	Price
Plain 16mm Film Reel	COM-74-11751-P	$10.00 Domestic 15.00 Foreign
Recordak Cartridge	COM-74-11751-R	14.00 Domestic 19.00 Foreign
3M Cartridge	COM-74-11751-M	14.00 Domestic 19.00 Foreign
Thread Easy	COM-74-11751-T	14.00 Domestic 19.00 Foreign

Orders must specify the NTIS accession number given above and the form in which the buyer desires to receive the microfilm (also given above). Address orders to:

National Technical Information Service
U.S. Department of Commerce
Springfield, Va. 22151

Enclose payment in check or money order or authorization to charge the amount of the order to the buyer's NTIS deposit account or American Express card, giving the account number.

ALFRED C. MARMOR,
Jan. 17, 1974. *Acting Administrator for Documentation.*

Removal From Register

Pursuant to the provisions of Rule 347 of the Rules of Practice of the United States Patent Office in Patent Cases, a letter was directed on November 18, 1974, to Mr. Andrew G. Pullos at 714–716 Bank of America Bldg., 12 South First Street, San Jose, Calif. 95113, the last post office address furnished by him to the Committee on Enrollment. No reply was received within the period of thirty days therein set. Accordingly, his name is being removed from the Register of Agents.

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent Office. Information tending to affect the eligibility of any of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before February 28, 1975.

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

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Certificates of Correction for the Week of Feb. 4, 1975

3,645,599	3,812,099	3,837,744	3,847,640
3,674,623	3,812,253	3,837,842	3,847,658
3,721,704	3,813,317	3,837,843	3,847,733
3,724,341	3,813,855	3,839,209	3,847,793
3,724,442	3,813,922	3,840,022	3,847,804
3,726,417	3,816,539	3,840,303	3,848,089
3,736,145	3,817,327	3,840,435	3,848,102
3,736,640	3,817,724	3,840,510	3,848,124
3,737,032	3,817,822	3,840,836	3,848,177
3,745,223	3,819,367	3,841,119	3,848,259
3,749,186	3,819,695	3,841,880	3,848,273
3,755,263	3,819,761	3,841,926	3,848,332
3,757,122	3,820,881	3,841,999	3,848,421
3,758,243	3,821,178	3,842,097	3,848,452
3,762,319	3,821,307	3,842,324	3,848,519
3,763,915	3,822,560	3,842,848	3,848,534
3,768,885	3,822,998	3,842,959	3,848,762
3,772,507	3,823,900	3,842,970	3,848,785
3,773,709	3,824,116	3,842,986	3,849,004
3,773,764	3,824,285	3,843,285	3,849,174
3,774,188	3,825,274	3,843,505	3,849,392
3,775,048	3,825,351	3,843,592	3,849,457
3,778,414	3,825,728	3,843,644	3,849,482
3,780,791	3,826,846	3,843,667	3,849,851
3,780,792	3,828,152	3,843,750	3,850,346
3,781,020	3,828,610	3,843,770	3,850,414
3,781,594	3,828,860	3,843,922	3,850,652
3,785,223	3,829,913	3,844,273	3,850,734
3,793,098	3,831,355	3,844,524	3,850,774
3,796,864	3,832,045	3,844,570	3,850,822
3,797,736	3,832,399	3,844,693	3,850,984
3,799,167	3,832,673	3,844,750	3,851,109
3,799,249	3,832,973	3,844,773	3,851,212
3,800,364	3,833,461	3,744,841	3,851,262
3,801,348	3,833,477	3,845,132	3,851,676
3,801,952	3,833,684	3,845,391	3,852,044
3,803,560	3,833,892	3,845,564	3,852,158
3,803,784	3,834,222	3,845,649	3,852,210
3,805,522	3,835,093	3,845,749	3,852,328
3,806,706	3,835,450	3,846,178	3,852,355
3,806,961	3,836,044	3,846,273	3,852,770
3,808,359	3,836,317	3,846,623	3,852,809
3,808,872	3,837,007	3,846,685	3,853,393
3,809,552	3,837,088	3,846,899	3,853,554
3,810,468	3,837,557	3,847,548	3,853,713
3,811,165	3,837,594	3,847,556	

Patents Available for Licensing or Sale

2,995,619. SYSTEM OF TELEVISION TRANSMISSION AND PHOTOGRAPHIC REPRODUCTION OF THE TELEVISED IMAGE. Samuel Freeman, 13 Birchwood Court E., Syosset, N.Y., 11791.

3,415,339. FORK LIFT ATTACHMENT. Wilbur G. Hallauer, P.O. Box 70, Oroville, Wash., 98844.

3,461,565. MASON'S LINE STRETCHER. George T. Harris, 411 E. 20th St., Safford, Ariz., 85546.

3,774,193. WATCHMAN'S TOUR ALARM SYSTEM. Tulio Vasquez Restrepo, Carrera 43A No. 30–91, Medellin, Colombia.

3,776,795. METHOD OF JOINING THE ENDS OF MULTILAYER PRINTING FORMS. Elbert H. Stevenson, 415 Overland Drive, Stratford, Conn., 06497.

3,806,399. MECHANICAL CHRISTMAS TREE MANIFESTED BY ITS ROTATING MOTION AND THE UNDULATION OF ITS BRANCHES. Diosdado L. Cocjin, Philippines. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,811,169. ARRANGEMENT FOR INSERTING PREFABRICATED COILS OF WIRE INTO THE SLOT OF ELECTRICAL MACHINES. VEB Elektromat, Dresden, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,813,662. ELECTRICAL ALARM SYSTEMS. Nigel W. Lewis, Buckinghamshire, England. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,818,387. CURRENT GAIN FILTER. James J. Murphy, 2070 Latham St., Apt. 4, Mountain View, Calif., 94040.

3,824,538. MOTOR VEHICLE OPERATOR MONITORING SYSTEM. Cecil Slemp, Rte. 1, Box 120–A, Jarretsville, Md., 21084.

3,830,399. CONTAINER CLOSURE. Frederick W. Hill, Box 143, Palermo, W. Va., 25546.

3,836,051. OUTDOOR SALT DISPENSER. Robert W. Schmechel, 3454 W. Wrightwood Ave., Chicago, Ill., 60647.

3,843,178. OVER HEAD HAND OPERATED DOOR LOCK. Alexander Eskoff, 4214 Euclid Ave., East Chicago, Ind., 46312.

3,846,640. ELECTRICAL COMBINATION KEY LOCK. Nicholas W. Mihlhauser, 4514 Abbott, Apt. 12, Dallas, Tex., 75205.

3,850,379. BRAKE ACCESSORY FOR ROLLS OF TOILET PAPER AND THE LIKE. Mitchel Stern. Correspondence to: Sherman Levy, Suite 635, Washington Bldg., 15th & New York Ave., N.W., Washington, D.C., 20005.

The following 2 patents are offered by: Susan M. Peoples, 5201 Belleville Ave., Baltimore, Md., 21207.

D. 213,627. PORTABLE TWO-WAY COIN OPERATED TELEPHONE FOR INSTITUTIONS AND HOSPITALS.

D. 217,156. PORTABLE TWO-WAY COIN OPERATED TELEPHONE.

The following 2 patents are offered by: John O. Richards, 980 Mill Circle, Apt. 99, Alliance, Ohio, 44601.

3,578,840. REVOLVING REFLECTOR.

3,835,507. ROPE HOLDING DEVICE.

The following 2 patents are offered by: Betty Lasiter, % Bradshaw & Albright, 1003 Plaza Blvd., Suite 229, National City, Calif., 92050.

3,391,778. VEHICLE UNLOADER.

3,563,342. STOWABLE TRUCK LADDER.

Eastman Kodak Company announces that, in accordance with its policy, nonexclusive licenses upon reasonable terms are available to responsible applicants under the following U.S. Patent.

This offer is consistent with the practice of Eastman Kodak Company generally to grant non-exclusive licenses under unexpired U.S. patents issued to Kodak prior to 1970 on photographic inventions and on inventions made in the course of research or development work for the U.S. Government.

Inquiries regarding the availability of such licenses may be addressed to Director, Patent Department, Eastman Kodak Company, 343 State Street, Rochester, N.Y., 14650.

3,420,154. EASILY LOADED CAMERA WITH OPEN ENDED SPOOL.

The following 17 patents are offered by: R. S. Paulukonis, 6660 Greenbriar, Parma Heights, Ohio, 44130.

3,412,573. CRYOGENIC QUICK FREEZING APPARATUS

3,309,884. DEWAR DESIGN FOR STORAGE AND TRANSPORTATION OF CRYOGENIC FLUIDS.

3,570,523. SELF-REGULATING RECIPROCATOR DEVICE.

3,572,362. SELF-RECIPROCATING FOUR-WAY VALVE.

3,666,230. ELASTOMATIC VALVE.

3,672,396. METERING VALVE.

3,676,022. PNEUMATIC/HYDRAULIC PRESSURE ACTUATED POSITIVE DISPLACEMENT PUMP.

3,680,582. QUICK EXHAUST VALVE.

3,696,835. CONTROL VALVE.

3,703,125. PLASTIC ACTUATING CYLINDER.

3,706,325. SIMPLE CONTROL VALVES.

3,749,353. MEMBRANE SHUT-OFF VALVE.

3,761,204. POSITIVE DISPLACEMENT BOOSTERS.

3,768,517. SOLENOID OPERATED SIMPLE CONTROL VALVES.

3,815,481. POWER CYLINDER W/PISTON RETURN BY OWN VACUUM FORCE.

3,824,898. ENERGY CONSERVING DIRECTIONAL VALVE-CYLINDER COMBINATION.

3,831,816. CHEMICAL SYRINGE/DILUTER MIXER.

The following 23 patents are offered by: Walter S. Pawl, Adelphi, Md. Correspondence to: Paul J. Schmitz, 1121 University Blvd., W., #1105, Silver Spring, Md., 20902.

D. 198,671. CABANA.

3,143,939. LANDING MAT STRUCTURE.

3,225,504. LOCKED WALL PANEL JOINT FASTENER.

3,228,162. BUILDING PANEL ASSEMBLY.

3,226,907. PREFABRICATED ROOF STRUCTURE.

3,274,739. SHEET PANEL ASSEMBLY AND SUPPORTING MEMBERS THEREFOR.

3,241,284. MULTI-PANEL STRIP AND JOINT.

3,283,462. SEALING EXTRUSION FOR PANEL JOINT.

3,293,818. PANEL SEAL AND LOCK.

3,294,040. LEAD CARRYING PALLETT.

3,306,487. KNOCKED DOWN CARGO SHIPPING CONTAINER.

3,349,533. CHANNEL EXTRUSION AND SEAL FOR FRAMING PANEL EDGES.

3,376,679. SHEET PANEL WALL ASSEMBLY.

3,350,249. METHOD OF MAKING IMPREGNATED PLASTIC RIVET REINFORCED LAMINATED FIBRE SHEETS.

3,483,663. BUILDING WALL CONSTRUCTION.

3,462,819. SHEET PANEL WALL ASSEMBLY.

3,447,823. ANCHOR CLIP.

3,486,262. POST SIGN.

3,486,281. COMMODITY SHEET PANEL.

3,512,494. SUBMERSIBLE WATERCRAFT.

3,543,456. TOTAL LOCK BUILDING STRUCTURE.

3,677,212. SUBMERSIBLE WATERCRAFT.

3,221,452. FROST BARRIER AND VENT.

General Electric Company is prepared to grant non-exclusive licenses under the following 3 patents upon reasonable terms to domestic manufacturers.

Application for licenses under the following patents may be addressed to: General Electric Company, Division Patent Counsel, Housewares Business Division, 1285 Boston Avenue, Bridgeport, Conn., 06602.

3,722,117. STEAM NOZZLE IRON.

3,685,180. ADJUSTABLE SPRAYER IRON.

3,685,181. ADJUSTABLE MANUAL SPRAY IRON.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 110 patents.

Inquiries respecting licenses under these patents should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y., 10036.

3,828,121. COLOR SIGNAL PRODUCING SYSTEM UTILIZING SPATIAL COLOR ENCODING AND COMB FILTERING.

3,828,206. HIGH SPEED DRIVING CIRCUIT FOR PRODUCING TWO IN-PHASE AND TWO OUT-OF-PHASE SIGNALS.

3,828,284. MOTOR SPEED CONTROL SYSTEM.

3,828,258. SIGNAL DURATION SENSING CIRCUIT.

3,828,996. RECORD WEB CONTROL AND DRIVE APPARATUS.

3,829,612. VIDEO DISC PLAYBACK EDDY CURRENT SPEED CONTROL SYSTEM.

3,829,716. WIDE RANGE MONOSTABLE MULTIVIBRATOR CIRCUIT HAVING A CONSTANT CURRENT SOURCE.

3,829,853. HIGH - SPEED ANALOG - TO - DIGITAL CONVERTER.

3,830,447. ACTIVE NUTATION DAMPING IN DUAL-SPIN SPACECRAFT.

3,830,959. AUTOMATIC CENTERING CONTROL SYSTEM FOR TELEVISION APPARATUS.

3,831,037. PARAMETRIC AMPLIFIER HAVING AN IDLER CIRCUIT REDUCING SPURIOUS IDLER SIGNAL MAGNITUDE.

3,831,054. STORAGE TUBE ERASE CONTROL.

3,831,056. BEAM CURRENT STABILIZATION AND BLANKING APPARATUS.

3,831,074. ROTATOR SYSTEM INCLUDING A REMOTE DRIVE MOTOR AND A LOCAL INDICATOR-CONTROL MOTOR.

3,831,113. RELAXATION OSCILLATOR.

3,831,114. ENCAPSULATED MICROSTRIP CIRCULATOR WITH MODE ELIMINATION MEANS.

3,831,187. THYRISTOR HAVING CAPACITIVELY COUPLED CONTROL ELECTRODE.

3,832,495. INFORMATION TRANSFER SYSTEM FOR A PBX.

3,832,595. HORIZONTAL DEFLECTION SYSTEM WITH BOOSTED B PLUS.

3,832,651. DYNAMIC DIVIDING CIRCUIT FOR DIVIDING AN INPUT FREQUENCY BY TWO.

3,832,652. DYNAMIC DIVIDING CIRCUIT FOR DIVIDING AN INPUT FREQUENCY BY AT LEAST THREE.

3,833,375. METHOD OF REPAIRING AN IMPREFECT PATTERN OF METALIZED PORTIONS ON A SUBSTRATE.

3,833,383. HOLOGRAPHIC RECORDING MEDIUM.

3,833,408. VIDEO DISCS HAVING A METHYL ALKYL SILICONE COATING.

3,833,893. HOLOGRAPHIC MEMORY INCLUDING CORNER REFLECTORS.

3,834,653. CLOSED LOOP ROLL AND YAW CONTROL FOR SATELLITES.

3,834,905. METHOD OF MAKING ELLIPTICALLY OR RECTANGULARLY GRADED PHOTOPRINTING MASTERS.

3,835,248. KEYED AGC CIRCUIT.

3,835,253. TELEVISION COMMUNICATION SYSTEM WITH TIME DELAY COMPENSATION.

3,835,336. PULSE WIDTH SENSING CIRCUIT.

3,835,410. CURRENT AMPLIFIER.

3,835,421. MICROWAVE TRANSMISSION LINE AND DEVICES USING MULTIPLE COPLANAR CONDUCTORS.

3,836,825. HEAT DISSIPATION FOR POWER INTEGRATED CIRCUIT DEVICES.

3,836,845. APPARATUS FOR TESTING THE LINEARITY OF A CIRCUIT BY USING RATIO DETERMINING MEANS.

3,836,969. GEO-SYNCHRONOUS SATELLITES IN QUASI-EQUATORIAL ORBITS.

3,836,995. SEMICONDUCTOR DARLINGTON CIRCUIT.

3,836,996. SEMICONDUCTOR DARLINGTON CIRCUIT.

3,836,997. SEMICONDUCTOR DARLINGTON CIRCUIT.

3,837,071. METHOD OF SIMULTANEOUSLY MAKING A SIGFET AND A MOSFET.

3,837,656. CHIP REMOVAL IN THE MASTERING OF FINE-GROOVED DISCS.

3,838,240. BONDING TOOL AND METHOD OF BONDING THEREWITH.

3,838,304. METHOD OF MAKING A BIALKAI PHOTOCATHODE WITH IMPROVED SENSITIVITY AND HIGH TEMPERATURE OPERATING CHARACTERISTICS.

3,838,311. STORAGE TUBE FOCUS CONTROL.

3,838,834. SOLAR TORQUE COMPENSATION FOR A SATELLITE.

3,838,908. GUIDED LIGHT STRUCTURES EMPLOYING LIQUID CRYSTAL.

3,839,111. METHOD OF ETCHING SILICON OXIDE TO PRODUCE A TAPERED EDGE THEREON.

3,839,644. LABEL WRITING APPARATUS.

3,839,906. APPARATUS FOR ENGINE COMPRESSION TESTING.

3,839,907. ENGINE PERFORMANCE ANALYZER USING SIMULATED LOAD.

3,840,174. PRECISION DIGITAL INTERPOLATOR.

3,840,819. SIGNAL COMBINING CIRCUIT.

3,840,826. VARIABLE DELAY DEVICES USING FERROELASTIC-FERROELECTRIC MATERIALS.

3,840,889. LASER DIODE PACKAGE FORMED OF CERAMIC AND METAL MATERIALS HAVING HIGH ELECTRICAL AND THERMAL CONDUCTIVITY.

3,840.893. TRACK FOLLOWING SERVO SYSTEM.

3,841,881. METHOD FOR ELECTROLESS DEPOSITION OF METAL USING IMPROVED COLLOIDAL CATALYZING SOLUTION.

3,841,904. METHOD OF MAKING A METAL SILICIDE-SILICON SCHOTTKY BARRIER.

3,842,189. CONTACT ARRAY AND METHOD OF MAKING THE SAME.

3,842,194. INFORMATION RECORDS AND RECORDING/PLAYBACK SYSTEMS THEREFOR.

2,842,199. TELEPHONE IMAGE TRANSMISSION SYSTEM.

3,842,217. RECORD FABRICATION OF A CAPACITIVE TYPE STORAGE MEDIUM.

3,842,276. THERMAL RADIATION DETECTOR.

3,843,399. METALLIZED VIDEO DISC HAVING AN INSULATING LAYER THEREON.

3,843,420. SPUTTERED GRANULAR FERROMAGNETIC IRON-NICKEL-SILICA FILMS.

3,843,425. OVERLAY TRANSISTOR EMPLOYING HIGHLY CONDUCTIVE SEMICONDUCTOR GRID AND METHOD FOR MAKING.

3,843,836. COLOR MOTION PICTURE FILM PLAYBACK SYSTEM.

3,843,837. APPARATUS FOR GENERATING SAMPLE PULSES IN A TELEPHONE IMAGE TRANSMISSION SYSTEM.

3,843,843. TIME DIVISION MULTIPLE ACCESS SYNCHRONIZATION TECHNIQUE.

3,843,846. DEMOUNTABLE CAPACITIVE PROTECTIVE COUPLING FOR PICKUP TRANSDUCERS.

3,843,933. CURRENT AMPLIFIER.

3,845,295. CHARGE-COUPLED RADIATION SENSING CIRCUIT WITH CHARGE SKIM-OFF AND RESET.

3,845,328. TRI-STATE LOGIC CIRCUIT.

3,845,403. AMPLIFIER FOR AMPLITUDE MODULATED WAVES WITH MEANS FOR IMPROVING SIDEBAND RESPONSE.

3,845,405. COMPOSITE TRANSISTOR DEVICE WITH OVER CURRENT PROTECTION.

3,845,496. INFRARED PHOTOCATHODE.

D. 233,496. BAGGER STATION OR SIMILAR ARTICLE.

D. 233,668. CONTROL UNIT FOR AN ANTENNA ROTATOR.

3,845,530. METHOD FOR RENDERING CATHODE-RAY TUBE MORE RESISTANT TO IMPLOSION AND PRODUCT THEREOF.

3,845,738. VAPOR DEPOSITION APPARATUS WITH PYROLYTIC GRAPHITE HEAT SHIELD.

3,845,916. CARTRIDGE FOR ELONGATED RECORD MEDIUM.

3,846,165. METHOD OF APPLYING AN ANTI-REFLECTIVE COATING ON A SEMICONDUCTOR LASER.

3,846,198. METHOD OF MAKING SEMICONDUCTOR DEVICES HAVING THIN ACTIVE REGIONS OF THE SEMICONDUCTOR MATERIAL.

3,846,294. METHOD OF COATING THE INTERIOR WALLS OF THROUGH-HOLES.

3,846,328. METHOD FOR SEPARATING SULFIDE PHOSPHOR PARTICLES FROM MIXTURES.

3,846,649. PIEZOELECTRICAL TRANSDUCER COMPRISING ORIENTED ZINC OXIDE FILM AND METHOD OF MANUFACTURE.

3,846,674. OVERCURRENT PROTECTION CIRCUIT INCLUDING A HEAT SENSITIVE ELEMENT AND A THYRISTOR.

3,846,696. CURRENT ATTENUATOR.

3,846,819. METHOD FOR RECORDING TWO SEPARATE SIGNALS.

3,847,394. BOWLING PIN DETECTOR.

3,847,703. METHOD OF ALIGNING A LASER TUBE WITHIN AN ENVELOPE.

3,848,084. STORAGE TUBE CONTROL APPARATUS FOR A TELEPHONE IMAGE TRANSMISSION SYSTEM.

3,848,087. OPTICAL SCANNER CONTROL SYSTEM.

3,848,123. AUTOMATIC BRIGHTNESS CONTROL FOR IMAGE INTENSIFIER TUBE.

3,848,141. SEMICONDUCER DELAY LINES USING THREE TERMINAL TRANSFERRED ELECTRON DEVICES.

3,848,146. AC MOTOR.

3,848,191. ASYNCHRONOUS PULSE RECEIVER.

3,848,196. BROADBAND TRAPATT DIODE AMPLIFIER.

3,848,198. MICROWAVE TRANSMISSION LINE AND DEVICES USING MULTIPLE COPLANAR CONDUCTORS.

3,848,301. METHOD OF DIRECTLY SPACING A CATHODE-TO-GRID ASSEMBLY FOR A CATHODE-RAY TUBE.

3,849,635. HIGH SPEED PROGRAMMABLE COUNTER.

3,849,644. ELECTRON DISCHARGE DEVICE HAVING ELLIPSOID-SHAPED ELECTRODE SURFACES.

3,849,696. VERTICAL CONVERGENCE CIRCUITS.

3,849,782. COLLISION PREVENTION.

3,850,637. METHOD OF DENSIFYING SILICATE GLASSES.

3,850,710. METHOD OF MAKING A QUASI-MONOLITHIC INTEGRATED CIRCUIT STRUCTURE.

3,851,241. TEMPERATURE DEPENDENT VOLTAGE REFERENCE CIRCUIT.

3,851,258. GATELESS LOGIC FOR PRODUCING SELECTABLE PHASE CLOCK PULSES.

3,851,276. OSCILLATOR USING CONTROLLABLE GAIN DIFFERENTIAL AMPLIFIER WITH THREE FEEDBACK CIRCUITS.

3,851,298. WRAPPED WIRE CONNECTION.

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 4, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-31-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—R. F. BURNETT, Acting Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-1-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-6-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-12-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-28-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-29-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-10-73
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-2-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-16-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-20-73
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	7-27-73
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-1-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	6-17-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-1-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-15-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	6-3-74

Expiration of patents: The patents within the range of numbers indicated below expire during December 1974, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,814,802 to 2,818,566, inclusive
Plant Patents..... Numbers 1,661 to 1,671, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED FEBRUARY 4, 1975

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T931,001
PROCESS OF DYING USING MONOAZO DISPERSE DYES

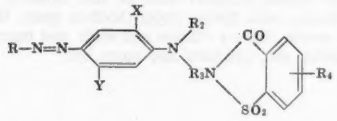
Abraham Reife, 60 Oakside Drive, Toms River, N.J. 06042, and Grady Malcolm O'Neal, 188 Garfield Ave., Island Heights, N.J. 07904

Continuation of application Ser. No. 88,240, Nov. 9, 1970, which is a continuation-in-part of application Ser. No. 773,325, Nov. 4, 1968, both now abandoned. This application Jan. 16, 1973, Ser. No. 394,377

Int. Cl. D06p *3/82*
U.S. Cl. 8—21 C

No Drawing. 31 Pages Specification

Improvement in dyeing permanent press fabrics which comprises using a dyestuff of the formula



wherein R is the residue of a diazotizable amine free from water solubilizing groups, X is hydrogen, alkyl, alkoxy or halogen; Y is hydrogen, alkyl, alkoxy, halogen or acylamino and R_2 is hydrogen or alkyl, hydroxy alkyl, cyano alkyl, alkoxy alkyl, aryloxy alkyl, acyloxy alkyl or halo alkyl; R_3 is an alkylene and R_4 is hydrogen, nitro, halogen or —CH=CH—CH=CH—. The fabrics thus dyed have excellent fastness properties.

T931,002
DRY SPINNING PROCESS

William Kenneth Wilkinson, Waynesboro, Va., assignor to E. I. du Pont de Nemours and Co., Wilmington, Del.

Filed Sept. 18, 1973, Ser. No. 398,302

Int. Cl. D01f *7/00*
U.S. Cl. 264—206

No Drawing. 10 Pages Specification

Process for providing acid-dyeability to acrylic fibers that have been dry spun. The process comprises dry spinning in dimethylformamide a polymer blend of

(a) a terpolymer of at least 75% acrylonitrile, at least 8% of a vinylpyridine and at least 2% of a neutral ethylenically unsaturated monomer copolymerizable with acrylonitrile, by weight, and

(b) a terpolymer of at least 85% acrylonitrile, up to 1% of a vinylarenesulfonic acid, and up to 14% of a neutral ethylenically unsaturated monomer copolymerizable with acrylonitrile, by weight,

the sum of the components of each terpolymer being 100%, and the terpolymers being mixed in amounts to provide at least about 5% by weight vinylpyridine in polymerized form in the polymer blend.

T931,003
POLYMERIC SOAPS

Michael Fryd, Philadelphia, and Achim R. Krueger, Upper Darby, Pa.

Continuation of application Ser. No. 372,844, June 22, 1973, which is a continuation of application Ser. No. 91,536, Nov. 20, 1970, both now abandoned. This application Dec. 17, 1973, Ser. No. 425,074

Int. Cl. C08f *15/02*
U.S. Cl. 260—79.3 M

No Drawing. 15 Pages Specification

Polymeric soaps, useful as thickeners in paints, which are random copolymers of at least two monomers, one bearing a pendant radical which solubilizes the polymer in whatever liquid is used as a carrier, and the other bearing a pendant long-chain radical which gives the soap its thickening effect.

T931,004
RECONSTITUTED TOBACCO

Eugene D. Klug, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 8, 1974, Ser. No. 459,248

Int. Cl. A24b *3/14*
U.S. Cl. 131—17 A

No Drawing. 4 Pages Specification

Reconstituted tobacco compositions are prepared using a tertiary amine group substituted ethyl cellulose, preferably diethylaminoethyl ethyl cellulose as a binder. The tertiary amine substituted ethyl cellulose dissolves in a slurry of tobacco fines acidified to a slightly acid pH. Upon drying of the slurry and removal of the acid, the diethylaminoethyl ethyl cellulose forms a binder for the tobacco which is insoluble and resistant to swelling in water. When the tobacco product is smoked, the binder does not dissolve or become slimy in the user's mouth.

T931,005
METHOD OF MONITORING PLASTICIZER CONCENTRATION IN FILTER TOW BY MEASURING FLUORESCENCE INTENSITY

Ethbert S. Carr, Jr., 4043 Skyland Drive 37664, and Gerald P. Morie, 2317 Briar Cliff Road 37660, both of Kingsport, Tenn.

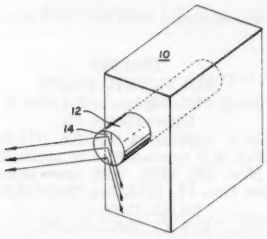
Filed May 6, 1974, Ser. No. 467,523

Int. Cl. G01n *21/16*
U.S. Cl. 250—302

1 Sheet Drawing. 12 Pages Specification

Method of monitoring the bonding plasticizer concentration in the filter tow of a tobacco smoke filter rod by adding a predetermined amount of fluorescent agent to a predetermined amount of plasticizer; applying to the filter tow prior to its being formed into a filter rod the bonding plasticizer and the added fluorescent agent; and measuring the intensity of fluorescence from a predetermined portion of one end of the subsequently formed filter rod. The measurement made has thus been found to be representative of a percentage of bonding plasticizer in the entire length of filter rod. The bonding plasticizer applied

to the filter tow may be preferably triacetin and the fluorescent agent added to the bonding plasticizer may be preferably butylated hydroxyanisole (BHA). More specifically, the bonding plasticizer may be a member of a group consisting of glyceryl triacetate (triacetin), ethylene glycol diacetate, triethylene glycol diacetate, propylene glycol diacetate, di(methoxyethyl)phthalate, dimethyl phthalate, and triethyl citrate. The fluorescent



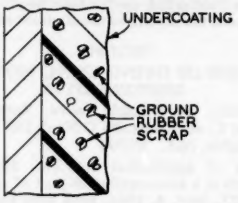
agent may be a member of the group consisting of propyl 3,4,5-trihydroxybenzoate, 3,5-di-t-butyl-4-hydroxymethyl benzene, 2,5-bis(5,7-di - tert - amylbensonasol-2-yl) thiophene, riboflavin, butylated hydroxyanisole, benzoic acid, 2-acetonaphthone, benzophenone, propyl p-hydroxybenzoate and 2,4,5-trihydroxybutyrophenone. With respect to the composition of glyceryl triacetate (triacetin) and butylated hydroxyanisole (BHA), 1000 parts of BHA may be added to one million parts of triacetin.

T931,006
SOUND-ATTENUATING COATINGS AND COATED PRODUCTS

Joseph R. Laman, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of abandoned application Ser. No. 355,363, Apr. 27, 1973. This application May 30, 1974, Ser. No. 474,649

Int. Cl. B32b *15/06, 25/04*
U.S. Cl. 117—132
1 Sheet Drawing. 10 Pages Specification



Scrap tires are ground or otherwise reduced to small size particles and 5 to 95 parts by volume were used in 100 parts by volume of noise-attenuating coatings, mixed with the coatings or applied to their surface. The coating vehicles will vary widely in properties, and the invention includes both water-base coatings and organic-base coatings. The invention includes not only the coatings but coated products such as auto fenders, hoods, truck covers, auto floors, under-the-floor mats, the ceilings of rooms, factory ceilings and walls, and many other sheet-metal, etc., products and parts, etc.

REISSUE PATENTS

GRANTED FEBRUARY 4, 1975

ERRATA

For CLASS	See PATENT NO.
219-137	28,326
073-181	28,327
339-091	28,328
267-065	28,329

REISSUES

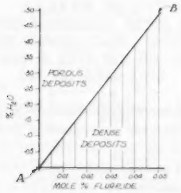
FEBRUARY 4, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

28,326
ARC WELDING ELECTRODE AND PROCESS FOR STAINLESS STEEL

Albert J. Zvanut, Whittier, Calif., assignor to Stoody Company

Original No. 3,670,135, dated June 13, 1972, Ser. No. 149,271, June 2, 1971, which is a continuation-in-part of Ser. No. 879,045, Nov. 24, 1969, now Patent No. 3,585,352, which is a continuation-in-part of Ser. No. 777,405, Nov. 20, 1968, now abandoned. Application for reissue May 20, 1974, Ser. No. 471,416
Int. Cl. B23k *9/00*
U.S. Cl. 219—137 38 Claims



1. A process for forming a stainless steel weld on a workpiece, comprising:

providing an arc welding electrode comprising a hollow tube of steel having as filler slag-forming material including a slag-forming first component and a derivative of a metal having an oxide form when molten different from said first component and soluble in said slag, said electrode being formulated with one or more alloying metals in amount sufficient to form a stainless weld of desired composition, *said slag-forming material being fused into vitreous particles prior to incorporation into said steel tube;*

said steel tube having a diameter of 0.045 to 0.30 inches, the weight ratio of said filler to said steel tube being 0.2/1 to 1.5/1 and the weight ratio of said slag-forming material to said alloying metals being 0.15/1 to 0.65/1;

electrically energizing said electrode; and

mechanically feeding said electrode toward said workpiece while maintaining an arc between the end of the electrode and the workpiece;

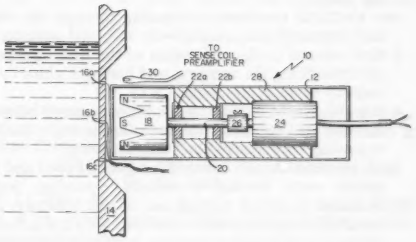
the components of said filler being chosen so that said filler, or fusion or decomposition derivative thereof, has an equilibrium moisture content at 70° F. and 90 percent relative humidity of less than 2.0 weight percent;

said filler including a fluoride, or a fusion or decomposition derivative thereof, in at least an amount corresponding to the level of moisture content of said filler as defined by the line A–B of FIG. 2 in the accompanying drawing, said fluoride comprising 5–100 weight percent of a compound selected from lithium fluoride, sodium fluoride, barium fluoride, magnesium fluoride, aluminum fluoride, potassium silicofluoride, sodium silicofluoride, and combinations thereof.

28,327
FARADAY EFFECT SPEEDOMETER

John R. Lewis, Framingham, Mass., by Safe Flight Instrument Corp., White Plains, N.Y., assignee.

Original No. 3,777,561, dated Dec. 11, 1973, Ser. No. 223,119, Feb. 3, 1972. Application for reissue Apr. 10, 1974, Ser. No. 459,543
(Filed under Rule 47(b) and 35 U.S.C. 118)
Int. Cl. G01p *5/08*
U.S. Cl. 73—181 22 Claims



1. A speedometer device adapted to measure the relative motion between a vessel and the water in which the vessel is disposed, which device comprises in combination:

a. a permanent magnet having at least one set of alternating north and south poles at one end thereof;

b. means to rotate the permanent magnet about its axis, and to provide an alternating magnetic field, the axis of the magnet adapted to be disposed generally perpendicular to the wall of the vessel whose motion relationship to the water is to be determined, the one end of the magnet in such a relationship to the wall of the vessel so that the alternating magnetic fields extend beyond the wall of the vessel and into the water in which the vessel is disposed;

c. means disposed in the alternating magnetic field and in contact with the water to measure the change in potential caused by motion of the vessel through the water, and to provide an alternating signal corresponding to the change in potential by such motion;

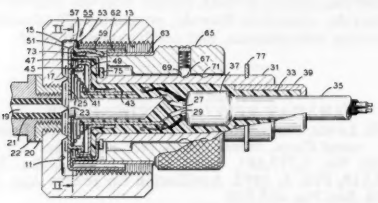
d. sensing means disposed in and responsive to the alternating magnetic field to provide a sensing signal; and

e. means to combine the alternating signal and the sensing signal to yield a signal value corresponding to the rate of movement of the vessel through the water.

28,328
LATCH TYPE PYROTECHNIC DETONATOR CIRCUIT TEST PROBE

Robert A. Williams, Fort Worth, Tex., assignor to Williams Instruments, Inc., Fort Worth, Tex.

Original No. 3,555,490, dated Jan. 12, 1971, Ser. No. 777,674, Nov. 21, 1968, which is a continuation-in-part of Ser. No. 756,085, Aug. 14, 1968. Application for reissue June 16, 1971, Ser. No. 153,906
Int. Cl. H01r *13/24, 17/18, 33/14*
U.S. Cl. 339—91 R 12 Claims

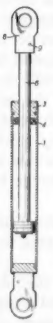


1. A pyrotechnic detonator circuit test probe comprising:
an elongated body;
a pair of electrical contacts secured to an end region of the body;
two electrical conductors extending through the body and communicating respectively with said contacts;
a shell secured to the end region of the body generally circumscribing the contacts, and having a plurality of radially oriented apertures;
a movable sleeve carried by the body to move between forward and rearward positions and having a portion extending between the shell and the body;
latch elements carried between the [body] *shell* and the sleeve, each having a radially extending finger mounted to extend through one of said apertures and an axially extending base connected with and actuated by the movable sleeve resulting in selective protrusion of each finger through the associated aperture.

28,329
PNEUMATIC SPRINGS

Lawrence G. Nicholls, Birmingham, England, assignor to Girling Limited

Original No. 3,595,552, dated July 27, 1971, Ser. No. 825,186, May 16, 1969. Application for reissue Apr. 18, 1973, Ser. No. 352,257
Claims priority, application Great Britain, May 21, 1968, 24,216/68
Int. Cl. B60c *9/36*
U.S. Cl. 267—65 6 Claims

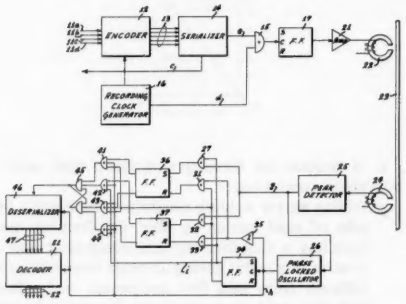


1. A pneumatic spring comprising a cylinder having a pressure seal at its outer end, a piston and a piston rod extending slidingly and sealingly through the pressure seal, said piston rod having near its outer end a portion of reduced cross section less than the inner diameter of said seal, the relative dimensions of said seal and said portion of reduced diameter being such that when said portion is aligned with said seal the space between said seal and said portion of reduced cross section defines a passage for the flow of gas into or out of said cylinder without deflection of said seal, and a removable end fitting secured to the outer end of said piston rod to prevent inward movement of said rod sufficient for said reduced portion to be aligned with said pressure seal except when said fitting is removed from the outer end of said piston rod.

28,330
SELF-CLOCKING FIVE BIT RECORD-PLAYBACK SYSTEM

Gene E. Milligan, Torrance, Calif., assignor to NCR Corporation, Dayton, Ohio

Original No. 3,641,525, dated Feb. 8, 1972, Ser. No. 64,355, Aug. 17, 1970. Application for reissue Jan. 30, 1974, Ser. No. 438,027
Int. Cl. G11b *5/02*
U.S. Cl. 360—48 13 Claims



1. A system for magnetically recording and reproducing digital data comprising:
[an encoder for converting a four-bit binary code to a five-bit binary code allowing combination of two successive bits only as like binary digits;]
a recording medium;
recording means [connected to said encoder] for recording digital data in [said] *a* five-bit binary code on said recording medium, whereby the polarity of said recording medium is reversed to record only one of a pair of binary digits;
an encoder connected to said recording means for converting a four-bit binary code to said five-bit binary code allowing combination of only two successive bits as the second of said pair of binary digits;
playback means for sensing said reversals of polarity of said recording medium and generating pulses in response thereto;
an oscillator connected to said playback means effective to generate a wave having a frequency determined by said pulses;
and logic means connected to said playback means and to said oscillator for recovering said digital data.

PLANT PATENTS

GRANTED FEBRUARY 4, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,678
JUNIPER PLANT

Peter Mordigan, Sylmar, Calif., assignor to Select Nurseries, Inc., Brea, Calif.

Filed Mar. 26, 1973, Ser. No. 345,247
Int. Cl. A01h *7/00*

U.S. Cl. Plt.—50 1 Claim

1. A new and distinct variety of juniper plant substantially as shown and described, characterized by its very dwarfed size, its hardy slow prostrate growth habit forming a tightly compact ground covering shrub, its thin needle-like Cyprus Green juvenile leaves which are present all of the time, the leaves being resinous in texture, and by the absence of cones and seed.

3,679
AZALEA PLANT

Raymond Yoshimura, 827 S. Gladys, San Gabriel, Calif. 91772

Filed Aug. 2, 1973, Ser. No. 385,073
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—57 1 Claim

1. The new and distinct variety of azalea plant substantially as herein shown and described, characterized particularly as to novelty by the double, campanulate, predominantly Delft Rose blooms that have Garnet Lake dots borne in great profusion during cooler weather with many blooms on a stem, by its medium semi-upright growth habit, and by the dark green leaves that are wider compared to the length of the leaves than those of its parent plants.

3,680
AZALEA PLANT

Raymond Yoshimura, 827 S. Gladys, San Gabriel, Calif. 91772

Filed Aug. 2, 1973, Ser. No. 385,074
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—56 1 Claim

1. The new and distinct variety of azalea plant substantially as herein shown and described, characterized particularly as to novelty by the single to semidouble, campanulate, medium sized blooms that are predominantly Persian Rose in color having splotches that are Magenta Rose and spots that are small and are colored Chrysanthemum Crimson borne in great profusion during the cooler months with many blooms on a stem, by the long life of the blooms particularly during the cooler months, and by its large leaves and vigorous growth habit.

3,681
ST. AUGUSTINEGRASS

Jake T. Gruis, Apopka, and Terrance P. Riordan, Altamonte Springs, Fla., assignors to The O. M. Scott & Sons Company, Marysville, Ohio

Filed Oct. 2, 1973, Ser. No. 402,717
Int. Cl. A01h *5/12*

U.S. Cl. Plt.—88 1 Claim

1. A St. Augustinegrass, substantially as herein illustrated and described.

PATENTS

GRANTED FEBRUARY 4, 1975

ERRATA

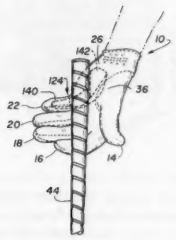
For CLASS	See PATENT NO.
071-100	3,863,474
074-347	3,863,503
264-047	3,863,908
251-138	3,864,031
356-074	3,864,037
252-051	3,864,099
261-142	3,864,326
426-284	3,864,494
313-390	3,864,585

PATENTS

GRANTED FEBRUARY 4, 1975

GENERAL AND MECHANICAL

3,863,271
ATHLETE'S GLOVE AND PAD
Martin A. Moroney, 269 Whitter Ave., Levittown, N.Y. 11756
Filed Jan. 2, 1974, Ser. No. 429,787
Int. Cl. A41d *19/00*
U.S. Cl. 2—161 A **3 Claims**

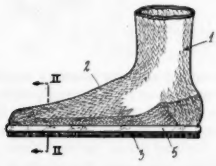


1. A hand glove for golfers and the like having finger stalls and a palm area including glove portions to cover the palm of a hand including the thenar and heel of the hand,

the invention comprising an elongated pad of pliable material connected to the glove palm extending along the heel portion thereof from the thenar portion to and along at least a portion of the extent of the smallest glove finger stall,

and a recess defined in said pad extending in a direction from the heel portion of the glove toward an opening between the thumb and forefinger of the glove when the same are wrapped about a club handle.

3,863,272
ARTICLE OF FOOTWEAR AND A METHOD FOR THE MANUFACTURE OF SAID ARTICLE
Robert Guille, Briatexte, France, assignor to Etablissements Oliver Guille & Fils S. A., Briatexte, Tarn, France
Filed Sept. 6, 1973, Ser. No. 394,812
Claims priority, application France, Sept. 21, 1972, 72.33443
Int. Cl. A43b *17/00, 17/18*
U.S. Cl. 2—239 **3 Claims**



1. Article of footwear comprising a sock of knitted textile material, a sole of flexible material having a fibrous structure selected among the group consisting of velvet-pile fabrics, felt fabrics and tagged carpet fabrics, a molded side portion of plastic material selected among the group consisting of polyvinyl chloride, polyurethane resin and rubber which covers at least part of the periphery of the foot of the sock and the periphery of the sole and attaches the sole to the sock, said part of the periphery of the sock which is covered by the plastic material being knitted in sufficiently close stitches to prevent the penetration of the plastic material through the stitches.

2. A method for the manufacture of an article of footwear comprising:

a. fitting a sock of knitted textile material over a rigid forming-block having the general shape of a foot, at least part of the periphery of the foot of the sock being knitted in close stitches;

b. placing on the bottom of a mold a sole of flexible material having a fibrous structure selected among the group consisting of velvet-pile fabrics, felt fabrics and tagged carpet fabrics;

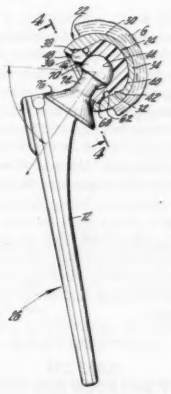
c. engaging in said mold the end of the forming-block which carries the foot of the sock;

d. maintaining the bottom portion of the foot of the sock applied against the sole;

e. injecting into the mold a hardenable plastic material selected among the group consisting of a polyvinyl chloride, polyurethane resin and rubber, in order to form on said part of the periphery of the foot of the sock which is knitted in close stitches and on the periphery of said sole of flexible material a molded side portion;

f. and after the plastic material has hardened removing the article of footwear from the mold.

3,863,273
ORTHOPEDIC PROSTHETIC IMPLANT DEVICES
Robert G. Averill, Ringwood, N.J., assignor to Meditec, Inc., Fair Lawn, N.J.
Filed Sept. 20, 1973, Ser. No. 398,925
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **11 Claims**



1. An implantable prosthetic joint for use in replacement of the ball end of defective biological joints, said prosthetic joint including a head for insertion into and unattached seating in the socket member of the biological joint being partially replaced by said prosthesis, a bearing insert in said head, said bearing insert having a spherical seat, a ball shaped member seated in said spherical seat in said bearing insert, said bearing insert including means for engaging said ball shaped member and for retaining said ball shaped member in said bearing insert while permitting pivotal universal movement of said ball shaped member, means for engaging and retaining said ball shaped member in said bearing insert including a one-piece

insert having a plurality of arcuate sections at the open edge of said insert which, when said head is removed, are flexible outwardly to allow said ball shaped member to be inserted into said spherical seat and which, when said ball shaped member is in said spherical seat, and said head is placed over said bearing insert, are engaged by said head for retaining said ball shaped member in said bearing insert, attaching means in said bearing insert and means for attaching said ball shaped member to the shaft of the second anatomical member of the joint being partially replaced.

3,863,274

ARTICULATE JOINT FOR PROSTHETIC DEVICES

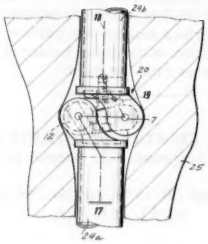
Richard Glabiszewski, Duderstadt, Germany, assignor to Otto Boch Orthopadische Industries KG, Duderstadt, Germany

Filed June 6, 1973, Ser. No. 367,420

Claims priority, application Germany, June 10, 1972, 2228391

Int. Cl. A61f *1/04, 1/08*

U.S. Cl. 3—27 **11 Claims**



1. An articulated joint, particularly a knee joint for an artificial leg, comprising a pair of substantially parallel transversely spaced shafts, the axes of which are located when a force is applied to said joint in a substantially horizontal plane; collar means having one portion substantially surrounding one of said shafts and having an upper and a lower portion laterally projecting from said one portion and being separated by a slot having a predetermined width in the absence of a force applied to said joint and said lever portions being elastically yieldable toward each other upon application of a force to said joint, said lower lever portion being pivotally connected to the other of said shafts; a lower joint member connected to said one shaft for turning therewith; and an upper force transmitting joint member turnably carrying the other shaft and engaging said upper lever portion for pressing the latter towards said lower lever portion to cause said collar means to frictionally engage said one shaft.

3,863,275

SIT-UP BATHTUB AND SHOWER

Thomas Brendgord, and Robert D. Copeland, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Continuation of Ser. No. 234,701, March 15, 1972, abandoned. This application Nov. 9, 1973, Ser. No. 414,380

Int. Cl. A47k *3/022*

U.S. Cl. 4—173 **5 Claims**

1. A bath structure comprising a door and a tub having a bottom, four side walls, a door opening in one of said side walls,

said door hinged to one said wall and swingable to close said door opening,

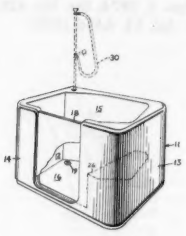
and a latch means on said door for fastening the said door in closed position in said opening,

a flat platelike jamb member extending around the sides and bottom of said door opening,

and an inflatable seal fixed to said door and extending around said door,

pump means,

said pump means having a cylinder connected to said seal, said inflatable seal terminating on said door at a position



below said latch means whereby said latch means can engage said tub above said inflatable seal,

said pump means being built into said door and having a handle extending upward from said door for inflating said seal to bring said seal into sealing engagement with said platelike jamb member.

3,863,276

COMMODES

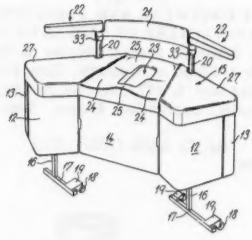
Kenneth Malcolm Agnew; Timothy Coward, and Douglas Frazer Tomkin, all of London, England, assignors to National Research Development Corporation, London, England

Filed Feb. 17, 1972, Ser. No. 227,528

Claims priority, application Great Britain, Feb. 18, 1971, 4939/71

Int. Cl. G03d *9/00, 11/00;* **A47k** *11/02*

U.S. Cl. 4—237 **10 Claims**



1. A unitary moulded seat for sanitary equipment, which seat has an upper surface at least partially defined by:

an elongate aperture wholly bounded by said surface, and extending longitudinally between the front and rear of said seat;

two elongated thigh-supporting first profiled areas individually laterally dished to a concave trough form and positioned to extend longitudinally, in mutually spaced manner, from the front periphery of said seat to corresponding locations in the central region along respectively opposite sides of said aperture; and

a generally U-shaped buttock-clearance second profiled area extending around the rear and partway along the sides of said aperture to join said first areas, said second area being concavely dished in both the longitudinal and lateral directions and extending to a greater extent in said seat than said first areas, and said second area being joined to each of said first areas by respective similar abrupt changes of profile.

3,863,277

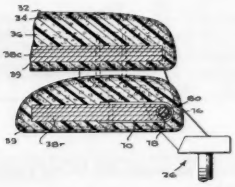
SOFT TOILET SEAT

David E. Harrison, Columbus, Miss., assignor to Beneke Division, Beatrice Foods Co., Columbus, Miss.

Division of Ser. No. 278,862, Aug. 8, 1972,. This application July 20, 1973, Ser. No. 381,060

Int. Cl. A47k *13/02*

U.S. Cl. 4—237 13 Claims



1. A soft, substantially gas and liquid impervious, sanitary toilet seat assembly comprising:

a seat having an integral outer skin consisting essentially of an impervious film former,

a core of polyurethane foam having an integral high density tough skin and an inner core of lower density soft foam containing cells at least partially filled with a gas; a substantially rigid insert positioned within and surrounded by said inner core and said high density tough skin,

and hinge means secured to said seat to permit pivotal movement of said seat whereby in use said gas is displaced wholly within said outer skin to provide a soft surface without transmitting odors.

3,863,278

PERFECTED DEVICE: A FOLDING SPRING BED CONVERTIBLE INTO A TABLE

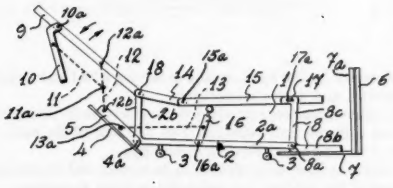
Jose Pardo Herrera, Carretera de Lograno, Kilometro 1,7000, Zaragoza, Spain

Filed Aug. 3, 1973, Ser. No. 385,426

Claims priority, application Spain, Aug. 4, 1972, 182970

Int. Cl. A47c *13/38*

U.S. Cl. 5—3 6 Claims



1. An article of furniture in the form of a convertible table and bed comprising a pair of fixedly spaced apart, parallel vertical side panels having inner surfaces, frame members mounted on said inner surfaces, an articulated spring bed unit having a head section, a foot section and an intermediate section pivotally connected together for movement from a coplanar horizontal position into a folded position collapsed within the confines of the space between the side panels, said head and intermediate sections being pivotally supported by the frame members, said bed section being movable about said pivots from a collapsed position between the side panels in one longitudinal direction paralleling the longitudinal axis of the side panels with the intermediate and front sections unfolding outwardly and downwardly about the head section which swings upwardly, a first end panel pivotally connected to the frame members, a second end panel pivotally connected to the frame members, said end panels being movable from lowered substantially horizontal positions when the bed unit is in an open horizontal placement into raised vertical positions wherein they complement the side panels in enclosing the folded bed unit, and a top panel carried by the second end panel and adapted to be positioned in a horizontal position resting on the upper edges of the end and side panels and completely overlying the folded bed unit to form the top of the table and complete the enclosure for the folded bed unit which is completely hidden from view in any direction by the assembled panels.

3,863,279

PIECE OF FURNITURE FOR A RIGHT-ANGLED CORNER OF A ROOM

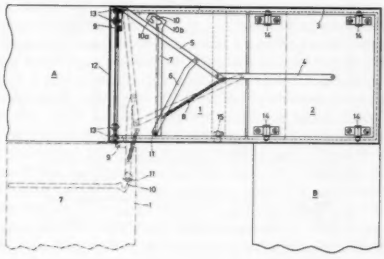
Fritz Stalder, Burgdorf, Switzerland, assignor to Ulrich Oppliger, Burgdorf (Canton of Berne), Switzerland, a part interest

Filed Oct. 15, 1973, Ser. No. 406,623

Claims priority, application Switzerland, Oct. 24, 1972, 15488/72

Int. Cl. A47c *17/14*

U.S. Cl. 5—8 8 Claims



1. Piece of furniture to be located in a right-angled corner of a room comprising at least two bodies shiftably arranged in a horizontal plane, said bodies being disposed side-by-side in a common frame, characterized by a draw and push mechanism fixed to the outside of said bodies, said draw and push mechanism connecting both the bodies in such a way that by swivelling the first body which has been drawn out of the frame by 90° about its vertical hinges the second body is shifted to occupy the vacant place or to leave it.

3,863,280

SETTEE-BED WITH BACKREST CONVERTIBLE TO AN UPPER BED

Ned W. Mizelle, High Point, N.C., assignor to Hoover-Seng Company, Chicago, Ill.

Filed Dec. 6, 1973, Ser. No. 422,534

Int. Cl. A47c *17/40*

U.S. Cl. 5—9 R 18 Claims

1. In a settee which is installed between a pair of fixed structural members that are at opposite ends of the settee, said settee including a seat adapted to serve as a bed, a backrest structure convertible to an upper bed spaced above the seat, said backrest structure comprising, in combination:

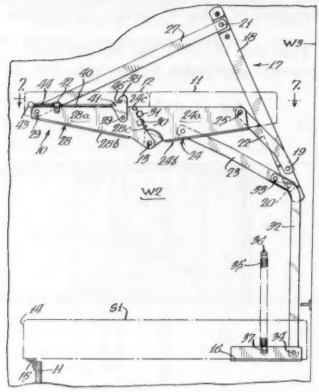
a first backrest member which occupies an upright settee position above the rearward portion of the seat and has an upper side and a forwardly facing cushioned surface; a second backrest member which occupies an upright settee position behind said first backrest member and has an upper side and a rearwardly facing cushioned surface; hinge means connecting said backrest members at their lower sides;

a pair of mounting brackets, one on each of the structural members, said mounting brackets having aligned first and second lower pivots which are adjacent the upper sides of

the backrest members when said members are in their settee positions, and said mounting brackets having aligned upper pivots above the upper bed position of the backrest;

a pair of first lower link members each pivotally connected at one end to said first lower pivots and at the other end to the upper side portion of the first backrest member;

a pair of second lower link members each pivotally connected at one end to said second lower pivots and at the other end to the lower side portion of the first backrest member,



said first and second lower link members, said brackets between said first and second lower pivots, and said first backrest member forming a four bar linkage which has a swinging movement from said settee position to a position in which said second backrest member is horizontal with its cushioned surface uppermost;

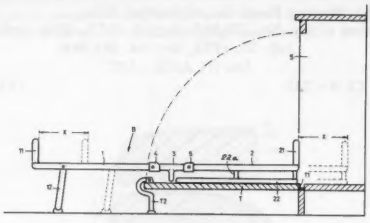
and a pair of hanger links each pivotally connected at one end to an upper pivot and at the other end to the upper side portion of the first backrest member, said hanger links turning about the upper pivots during said swinging movement to guide the second backrest member to a position with its cushioned surface uppermost and coplanar with the cushioned surface of the first backrest member.

3,863,281
FOLDING BED

Milorad Tosic, 11, Avenue Grammont, CH-Lausanne, Switzerland

Filed May 31, 1973, Ser. No. 365,447
Claims priority, application Switzerland, June 1, 1972, 8173/72
Int. Cl. A47c *19/06*
U.S. Cl. 5—136 **9 Claims**

1. A folding bed adapted to be stored in a wall opening, comprising a bed frame having a plurality of sections, link means pivotally joining said sections together to be folded transversely to its longitudinal axis into a compact assembly having a width equal to its length, a panel hinged along a horizontal axis at said wall opening, and means for rotatably mounting one section of said frame to said panel to permit said frame to be swivelled about an axis perpendicular with respect to said panel allowing said bed to be opened with its longitudi-

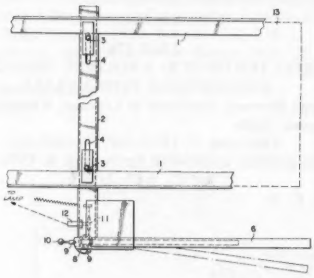


nal axis selectively perpendicular to and parallel to the horizontal hinge axis.

3,863,282
SUPPORT BAR FOR BEDS

Elbert M. Stillwell, Bryson City, N.C., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 4, 1974, Ser. No. 430,900
Int. Cl. A47c *21/00;* **A61g** *7/08*
U.S. Cl. 5—317 B **2 Claims**



1. A device for use by an invalid in leaving a bed and returning thereto, said device comprising:

a horizontal bracket extending transversely underneath said bed with one end extending past one side of the bed;

means securing said bracket to said bed;

a vertical hollow stand secured at its bottom end to said one end of the bracket and extending upward therefrom;

a vertical post disposed rotatably in the stand and extending thereabove;

a horizontal arm secured at one end to the top of the post and rotatable therewith;

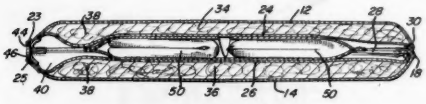
a spring loaded lock arm disposed in a vertical plane and rigidly attached to the stand; and

a horizontal lock plate having two lock notches spaced by 90° of arc and rigidly secured to the post, the plate and lock arm cooperating, with the spring in the lock arm causing the lock arm to engage one of the notches of the plate when the horizontal arm is swung to a first position at which the horizontal arm is parallel to the longitudinal axis of the bed and to engage the other notch when the horizontal arm is swung to a second position at which the horizontal arm is perpendicular to said axis whereby the horizontal arm once placed in either position will be locked therein until the lock arm is manually released to allow further movement.

3,863,283
PILLOW WITH INTERIOR STORAGE COMPARTMENT

Carsten Mohr, 1550 Yellowstone, Space 97, Pocatello, Idaho 83201

Filed June 14, 1973, Ser. No. 369,931
Int. Cl. A47g 9/00
U.S. Cl. 5—341 6 Claims



1. A pillow having space therein for the storage of first-aid equipment comprising:

a. an outer pillow envelope comprising first and second outer panels having substantially identical peripheries joined along said peripheries and including a non-joined portion for access to the interior of said envelope;

b. first and second liner panels disposed between said outer panels and having peripheries substantially identical to said panel peripheries, each said liner panel joined about its entire periphery to one of said first and second panels and defining therewith an enclosed pocket, said liner panels defining therebetween an interior storage compartment adapted to receive first-aid equipment therein;

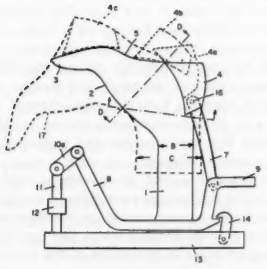
c. pillow filler material in each said enclosed pocket, said filler material sufficient to comprise comfortable padding for a head thereon when first-aid equipment is in said storage compartment; and

d. releasable closure means closing said non-joined portion.

3,863,284
LAST AND APPARATUS FOR REMOVING FOOTWEAR THEREFROM

Anton I. Liebscher, Waynesville, N.C., assignor to Ro-Search, Incorporated, Waynesville, N.C.

Division of Ser. No. 299,130, Oct. 19, 1972, Pat. No. 3,803,657. This application Jan. 29, 1974, Ser. No. 437,675
Int. Cl. A43d 3/00
U.S. Cl. 12—135 A 3 Claims

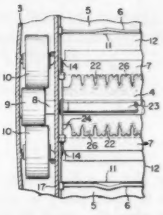


1. Apparatus for manufacture of footwear comprising a collapsible last having a main portion and a sole plate, means to collapse said last after footwear including a sole has been formed thereon, means within said finished footwear to move the same relative to said last, and means to move said sole plate in relation to said main portion.

3,863,285
CARPET SWEEPER

Hiroshi Hukuba, No. 914-1, Nazukari, Nagareyama-shi, Chiba-ken, Japan

Filed July 5, 1973, Ser. No. 376,700
Int. Cl. A47l 11/33
U.S. Cl. 15—48 3 Claims



1. A carpet sweeper, comprising in combination: a rotating brush supported transversely within the lower portion of a housing to sweep up the dust on the floor during movement of said housing along the floor surface; a cleaning comb attached to said housing in parallel with the axis of said rotating brush in such a manner that it is positioned above and behind the rotating brush relative to the direction of movement along the floor, the comb having elongated teeth and being positioned so that the teeth penetrate deeply into the rotating brush to rake therefrom the dust clinging thereto; and a dust receiver disposed just behind said cleaning comb for reception of the dust raked away from the rotating brush by said cleaning comb; the improvement wherein said cleaning comb has a substantially flat base plate with a plurality of said elongated teeth projecting outwardly from one edge thereof, the adjacent teeth being spaced apart by a space having a width several times greater than the width of a single tooth, a plurality of small triangular-shaped projections projecting outwardly from said one edge of said base plate, said projections being spaced between said teeth and projecting into said spaces, said projections having a length which is extremely small in comparison to the length of said teeth, and said projection having a width at the base end thereof which is substantially less than the width of said space so that there remains a substantially straight base edge of substantial length extending between the base end of the projection and the base end of an adjacent tooth, said comb being positioned adjacent said brush so that the teeth penetrate deeply into said brush while the tips of the projections slide along the periphery of the brush and the base edge of each space barely comes into contact with the periphery of the brush.

3,863,286
SPARK PLUG CLEANER

James E. Puckett, 14495 S.W. Barlow Rd., Beaverton, Oreg. 97005

Filed Nov. 12, 1973, Ser. No. 414,739
Int. Cl. H01t 21/04
U.S. Cl. 15—104.01 R 4 Claims

1. A spark plug cleaning device comprising:

a cylindrical container adapted to contain a cleaning fluid; end closure means for each end of said container;

a first internally threaded aperture axially disposed in one of said end closure means;

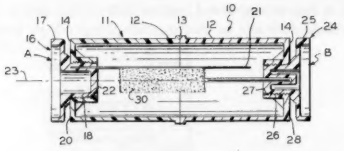
first externally threaded plug means adapted to be removably received in said first internally threaded aperture;

generally axially extending file means mounted in said first externally threaded plug means and adapted to be disposed internally of said container;

a second internally threaded aperture axially disposed in the other of said end closure means;

second externally threaded plug means adapted to be removably received in said second internally threaded aperture;

generally axially extending brush means mounted in said second externally threaded plug means and adapted to be disposed internally of said container;



said file means and said brush means being axially offset with respect to each other to permit the same to nest together and mutually clean each other as they are replaced in said container;

each of said internally threaded apertures in said end closure means being adapted to receive a threaded end portion of a spark plug to be cleaned.

3,863,287

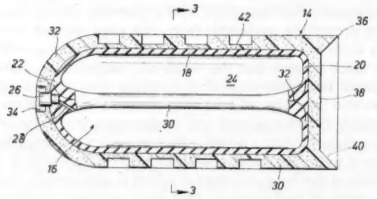
PIPELINE PIG

Kenneth M. Knapp, and Charles C. Knapp, Jr., both of 1209 Hardy St., Houston, Tex. 77020

Filed July 9, 1973, Ser. No. 377,389

Int. Cl. B08b *9/04*

U.S. Cl. 15—104.06 R **10 Claims**



1. A pipeline pig which comprises:

an inflatable elongate bladder means formed of a resilient wall which encloses a cavity;

an outer body portion adapted to be placed about said bladder means and having an outer wall which is adapted to contact a pipeline and which is further adapted to be worn away by contact therewith; and,

wherein said bladder means tends to expand on inflation and further including means limiting increases in length thereof.

3,863,288

COSMETIC BRUSH DEVICE

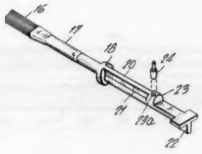
Joseph Aversa, Scarsdale, N.Y., assignor to Aversa and Martin, Inc., New York, N.Y.

Filed June 18, 1973, Ser. No. 371,147

Int. Cl. A46b *9/10*

U.S. Cl. 15—184 **2 Claims**

1. A cosmetic brush applicator comprising: a cylindrical housing having a first opening at one end and having a diminished portion at the other end terminating in a second smaller opening; said housing formed with a longitudinal slot in its wall; an elongated stem within said casing supporting a brush at one end and terminating in a flexible T-shaped cross sectional portion at the other end formed by a depending tab normal to said flexible T-shaped portion for aligning the stem within the housing; a pin secured to the elongated stem adjacent the flexible portion of said stem and projecting outwardly through the slot in the housing for limiting the travel of the



stem and brush; and a hollow cap slidably received upon the housing for engaging the pin to extend the brush through the second opening.

3,863,289

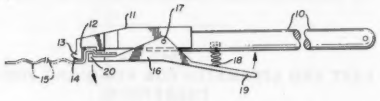
FLOOR MOP WITH SINGLE USE PAPER MOPPING ELEMENT

Richard E. Whittaker, 302 S. Croton Ave., New Castle, Pa. 16101

Filed July 23, 1973, Ser. No. 382,081

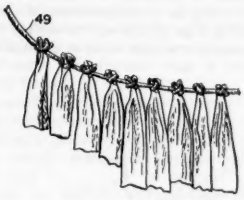
Int. Cl. A47l *13/24, 13/46*

U.S. Cl. 15—228 **3 Claims**



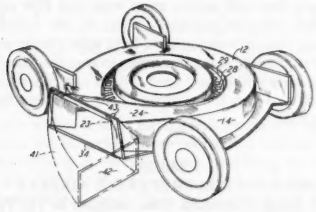
1. A floor mop and a single use paper mop element therefor, said mop comprising an elongate handle, a mop clamping element on one end of the handle, said clamping element including a first jaw member fixed to said one end of the handle, said first jaw member having an elongate channel in a bottom surface portion thereof extending transversely relative to the axis of the handle, an elongate, downturned mop engaging flange along a forward edge of said first jaw member at one side of the channel and extending downwardly from said first jaw member and having an arcuate, ribbed lower edge portion, a second jaw member pivotally connected to said one end of said handle for pivotal movement thereof relative to said first jaw member and having an upturned elongate flange along a forward edge thereof substantially parallel with said downturned flange and movable toward and away from said first jaw member and registerable with said channel for clamping engagement with a mop element held between said firt and second jaw members, said downturned flange on said first jaw member extending downwardly beyond said upturned flange on the second jaw member and into close proximity with a floor surface when the handle is disposed with its axis at an angle to the plane of the floor surface, and a paper mop element clamped at a transverse portion thereof between the upturned flange and the channel and extending beneath the arcuate lower edge of said downturned flange, whereby the point of clamping of the mop element is spaced upwardly from the floor surface and thus spaced from the area of contact of the mop element with water and the like, and said arcuate lower edge of said downward flange pressing said mop element against the floor surface in various angular positions of the handle relative to the floor.

3,863,290
FLEXIBLE SCRUBBING MEANS
Jerome M. Lesser, 713 Parkway, Fultondale, Ala. 35068
Division of Ser. No. 139,151, April 30, 1971, Pat. No. 3,765,043. This application Aug. 2, 1973, Ser. No. 385,039
Int. Cl. B60s *3/04*
U.S. Cl. 15—229 R **1 Claim**



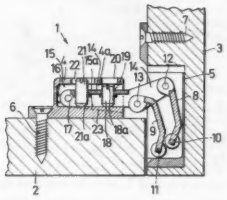
1. Flexible scrubbing means adapted to clean a vehicle comprising:
a strand of non-water absorbing material, and
a plurality of doubled, flexible absorbent cleaning strips suspended from and spaced along said strand,
each of said strips being attached to said strand at a different position on said strand by a slip knot in said strand at approximately the center bight portion of each strip.

3,863,291
CONVERTIBLE ROTARY LAWN MOWER AND AIR BLOWER
Neill C. Woelffer, Racine, Wis., assignor to Jacobsen Manufacturing Company, Racine, Wis.
Filed Nov. 26, 1973, Ser. No. 418,833
Int. Cl. A47l *5/02*
U.S. Cl. 15—328 **5 Claims**



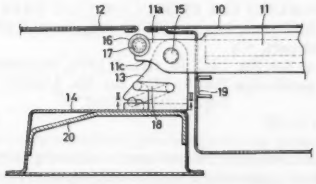
1. A convertible rotary lawn mower and air blower, comprising a rotary lawn mower housing including a top portion and including a skirt portion depending from said top portion and extending along the periphery of said housing and having an air outlet opening therein and terminating in a lower edge extending along a horizontal plane, a circular wall depending from said top portion and spaced radially inwardly from said skirt portion and defining an air channel with said skirt portion, a prime mover mounted on said housing, an air-fanning member supportedly mounted on said prime mover and being rotated thereby and including air-fanning blades disposed in said air channel for movement of air through said air channel and out said air outlet opening upon rotation of said air-fanning member, said housing top portion having air inlet opening therein disposed at locations spaced radially inwardly from said circular wall for the flow of air into said housing and into said air channel and out said air outlet opening, and a cover removably attached to said housing and extending fully across said skirt portion to be air-tight therewith at said lower edge thereof and defining the bottom of said air channel and enclosing the bottom of said housing to confine the flow of air in said air channel and thereby convert the rotary mower into an air blower.

3,863,292
CONCEALED HINGE FOR FURNITURE
Hellmuth Grunert, Hoffnungsthal, and Theodor Vitt, Porz-Eil, both of Germany, assignors to Prameta Prazisionsmetall-und Kunststofferzeuginsse G. Baumann & Co., Cologne, Germany
Filed Mar. 15, 1974, Ser. No. 451,561
Claims priority, application Germany, Mar. 17, 1973, 2313451; Feb. 11, 1974, 2406438
Int. Cl. E05d *3/06*
U.S. Cl. 16—164 **19 Claims**



1. A hinge comprising a pair of hinge elements, a pair of connecting rods having first and second opposite ends, first pivot means connecting first ends of said rods to a first of said hinge elements, an arm having first and second ends, second pivot means connecting second ends of said rods to said first arm end, third pivot means connecting said second arm end to said second hinge element, means mounting said second hinge element and arm for relative sliding movement in a direction generally normal to the axis of said third pivot means, and means for selectively adjusting the angular relationship between said arm and said second hinge element.

3,863,293
DOOR HINGE MECHANISM
Ryoichi Eukumoto, Nagoya City, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi Pref., Japan
Filed Mar. 14, 1973, Ser. No. 341,267
Claims priority, application Japan, Mar. 14, 1972, 47-30712; Apr. 3, 1972, 47-39273
Int. Cl. E05d *11/10*
U.S. Cl. 16—191 **6 Claims**



1. A door hinge mechanism provided between a movable door and a door pillar rigid with a chassis of a vehicle, comprising in combination:
a reinforcement member fixedly attached to an inner portion of said door,
a fixed member rigidly mounted on said pillar,
a stopper means provided on said fixed member, and
a hinge pin member for pivotally mounting said reinforcement member and said fixed member and being serratedly connected with said reinforcement member,
said reinforcement member having first and second extended portions integrally formed thereon and parallel to

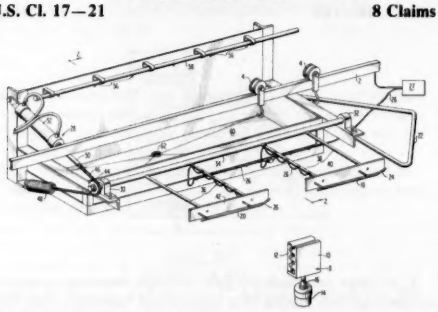
one another, and stopper faces formed on said first and second extended portions being connected with said stopper means upon door opening, whereby the open angle of said door is limited.

3,863,294

APPARATUS FOR APPLYING ELECTRICAL CURRENT TO LIVESTOCK CARCASSES DURING HIDE PULLING OPERATIONS

Wilford O. Barbee, Charter Oak, Iowa, assignor to Iowa Beef Processors, Inc., Dakota City, Nebr.

Filed May 4, 1972, Ser. No. 250,210
Int. Cl. A22b *05/16*
U.S. Cl. 17—21 **8 Claims**



1. Apparatus for applying electrical current to livestock carcasses during hide pulling operations, comprising

support means for supporting a carcass, said support means being maintained at a given electrical potential, said support means being a rail having trolleys movable therealong in a prescribed path,

mechanical means for gripping the hide of the carcass and for pulling the hide from the carcass,

a movably mounted electrode for contacting a carcass on the support means, said electrode being elongated in the direction of the prescribed path,

means for maintaining the electrode and the support means at different electrical potentials,

means for moving the electrode between a retracted position and an extended position where it is in contact with a carcass on the support means, and

means for sterilizing the electrode when it is in its retracted position.

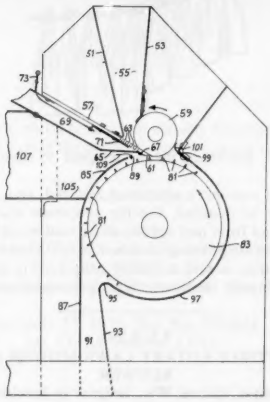
3,863,295

APPARATUS FOR PRODUCING CAST FABRICS

Richard R. Castor, Fairport, N.Y., assignor to Cast Fabrics Inc., Fairport, N.Y.

Division of Ser. No. 185,736, Oct. 1, 1971, abandoned. This application Feb. 9, 1973, Ser. No. 330,923
Int. Cl. D01g *25/00*
U.S. Cl. 19—89 **4 Claims**

1. A casting head for preparing random-oriented air-borne fibers and casting such fibers onto a receiving surface, said casting head comprising a rapidly rotating beater roll having a multiplicity of teeth on the periphery thereof, a snubber member having a relatively sharp angular edge formed between two surfaces at an acute angle to each other, said edge extending parallel to the axis of rotation of said beater roll and facing in a direction opposite to the rotation of said beater roll, the second one of said two surfaces extending from said edge in the direction of rotation of said beater roll and in close proximity to the other ends of said teeth, a housing enclosing and approximately concentric with said beater roll and relatively close to the outer ends of said teeth throughout a substantial part of the circumference of the beater roll and having a flying bridge exit conduit arranged approximately tangentially to said beater roll at a location spaced circumferentially from said snubber member, means for feeding masses along the first one of said two surfaces toward said angular edge at a relatively slow rate compared to the peripheral speed of rotation of said beater roll, so that subh fibers will project beyond said angular edge into the path of travel of said teeth and be bent thereby around said angular edge and will tend to be forced against said second surface of said snubber member and be subjected to the action of said teeth to be combed thereby to separate masses of fibers into individual fibers, and means for introducing air under pressure into said housing adjacent the trailing edge of said second surface of said snubber member to supply a stream of air to assist in maintaining



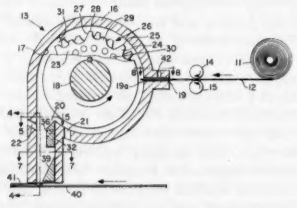
the fibers in individual spaced relation to each other and in pressing the fibers into cooperative relation to said teeth and in carrying the fibers around part of the circumference of the beater roll and out through said flying bridge exit conduit in random-oriented relation to each other, said feeding means comprising a feed roll cooperating with said first surface of said snubber member relatively close to the angular edge thereof, said feed roll including a fluid tight elastic periphery capable of expanding and contracting in response to variations of fluid pressure within said feed roll, to vary the diameter of the feed roll and vary the relation of the periphery thereof to said first surface.

3,863,296

PROCESS FOR PREPARING AIRFELT

Kenneth B. Buell, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 182,795, Sept. 22, 1971, Pat. No. 3,825,194. This application June 22, 1973, Ser. No. 372,728
Int. Cl. D01g *25/00*
U.S. Cl. 19—156.3 **1 Claim**



1. A process of disintegrated dried cellulosic fibrous sheet material and laying an airfelt therefrom comprising the steps of:

A. Feeding said fibrous sheet into a disintegrator comprising a disintegrating element having a plurality of impacting elements which have tips and a casing having a slotted opening terminating in a sheet support element, said casing defining, in combination with said disintegrating element, a restricted channel;

B. Supporting said sheet in said slotted opening;

C. Moving said disintegrating element such that the tips of said impacting elements move at a velocity of at least about 6,000 feet/minute;

D. Impacting said tips against the end of said fibrous sheet so that impact is substantially normal to the plane of said sheet whereby said fibrous sheet is disintegrated into individual fibers;

E. Mixing said fibers with air in said restricted channel with said impacting elements to complete disintegration while maintaining a relatively even fiber density gradient and air flow velocity gradient across the axial width of said channel; and

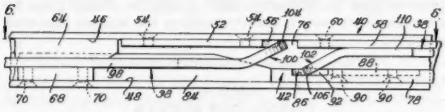
F. Removing the fiber/air mixture from the disintegrator along a tangent to the direction of motion of said impacting elements at the point of removal to a foraminous support positioned no more than about 3 feet away from said point at which the fiber/air mixture leaves said impacting elements so that said fiber/air mixture retains sufficient kinetic energy imparted thereto by the impacting elements to form an airfelt on said foraminous support, said air passing through said foraminous support and leaving said fibers on said foraminous support in the form of an airfelt.

3,863,297

BALE TIE INTERLOCK DEVICE

Emil Simich, Chicago, Ill., assignor to A. J. Gerrard & Company, Des Plaines, Ill.

Filed May 24, 1974, Ser. No. 472,944
Int. Cl. B65d *63/10*; **B65b** *13/02*
U.S. Cl. 24—27 **10 Claims**



1. For use with a bale tie having preformed first and second end sections which include loop portions, a bale tie interlock device comprising a body member defining an elongated channel generally U-shaped in cross section, an elongated plunger longitudinally slidable in said channel and disposable to project outwardly of one end thereof in a loading position, first hook means in said channel intermediate of the ends thereof and engageable by the first bale tie end section inserted into the other end of said channel, second hook means on said plunger and engageable by the second bale tie end section inserted into said plunger at said one end of said channel, and said plunger being movable from said loading position inwardly of said channel to move the second bale tie end section through the first bale tie end section to interengage the same.

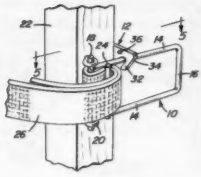
3,863,298

WEB LOCK AND TIGHTENER

Olaf C. Sohn, 755 Lincoln Ave., and Adolph M. Sohn, 619 Second Ave., both of Zumbrota, Minn. 55992

Filed Nov. 19, 1973, Ser. No. 416,842
Int. Cl. A43c *11/00*
U.S. Cl. 24—68 E **3 Claims**

1. A web lock and tightener for a strap length comprising a strap grip, a keeper, means pivotally mounting said grip for movement between a first inwardly directed loading position along a strap to be gripped thereby and a second outwardly directed position, said grip including first and second laterally spaced parallel bars, said first bar being located inward of said second bar in the first position of the grip for engagement of a strap over the first bar, around the second bar and back over the first bar, said second bar, upon movement of the grip to the second position, moving outward of the first bar in a manner so as to effect a bending of a bar overlying strap on itself and a corresponding clamping of the strap, said keeper being releasably engageable with said grip in the second position thereof for a retention of the grip in said second position, resilient spring means biasing said keeper toward engagement with the grip in the second position thereof, said keeper being manuually releasable from engagement with the grip, a cam



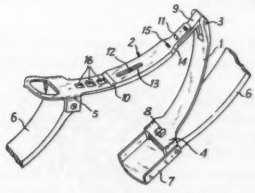
surface on said keeper directed toward said grip and orientated for engagement by said grip upon movement of the grip from the first to second position thereof for an upward camming of the keeper into retaining engagement with said grip, said grip also including an elongated side bar interconnecting said first and second bars, and a rigid support, said support including a pair of generally right angularly related faces, said grip being pivotally mounted to one face of said support in a manner so as to, in the second position of the grip, project beyond said second face, said keeper being mounted on the second face of the support and projecting beyond the first face thereof into the path of movement of the grip from the first to the second position thereof.

3,863,299

CLASP FOR A BRACELET

Robert Hocq, Boulogne-sur-Seine, France, assignor to Societe Anonyme Dite: Cartier, Paris, France

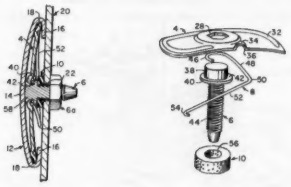
Filed May 16, 1973, Ser. No. 360,931
Int. Cl. A44c *5/24*
U.S. Cl. 24—71 J **4 Claims**



1. Clasp for a bracelet comprising two legs, each having one end pivotally connected to one end of the other leg and each provided at its other end with means for receiving a bracelet member, first locking means for locking the two legs of the clasp to each other, one of the two legs being telescopic and comprising two portions adapted to slide relative to each other, and second locking means distinct from said first locking means for locking the two portions of the telescopic leg in any of several relative positions corresponding to different lengths of the telescopic leg and defined by spaced openings in one of said relatively slidable portions, said first locking means comprising a spring clip fixed to one of the legs and spaced openings in the other leg spaced by the same distance as the openings in said one slidable portion, said first locking means being adapted to lock the legs of the clasp together with

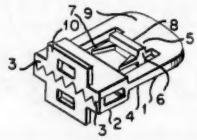
the two portions of said telescopic leg in any of said several positions.

3,863,300
MOLDING RETAINER AND METHOD OF COUPLING THE COMPONENT PARTS THEREOF
Charles Henry Becker, Braintree, Mass., assignor to TRW Inc., Cleveland, Ohio
Filed Aug. 18, 1972, Ser. No. 281,697
Int. Cl. A44b 21/00
U.S. Cl. 24—73 BC 9 Claims



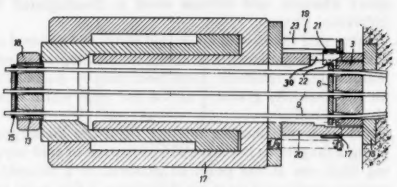
1. A retainer for securing a strip molding having inturned flanges along its side edges to an apertured workpiece, said retainer comprising an apertured cross plate having a first side which at least partially confronts and engages the inturned flanges of the molding, means for attaching said cross plate to the apertured workpiece, said last mentioned means including a head portion overlying the side of said cross plate remote from said first side and a shank portion extending through the aperture in said cross plate, said shank portion having a radially protruding shoulder overlying said first side of said cross plate in spaced relation to said first side, and means for biasing said cross plate into engagement with the molding flanges, said last mentioned means being connected to said shank portion of said attaching means and being clamped against said first side of said cross plate by said shoulder.

3,863,301
ELASTIC BANDAGE AND FASTENER THEREFOR
Harry H. Leveen, 800 Poly Pl., Brooklyn, N.Y. 11209
Filed Dec. 29, 1972, Ser. No. 319,881
Int. Cl. A44b 21/00; A61f 13/00
U.S. Cl. 24—85 R 2 Claims



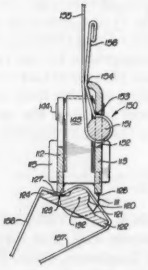
1. A fastener for elastic bandages which comprises a structure having a planar frame attached to a set of jaws said frame having side members thereof and a yolk supported by said side members and spaced apart from said jaws, said side members connecting said jaws and said yolk, a tine positioned between said side members facing said jaws but spaced apart therefrom and also spaced apart from said side members, said yolk, side members and tine all being in the same plane as the frame and jaws, said tine flexurally attached at its base to said yolk such that the free end or tip of the tine can be made to flex out of the plane of the frame and jaws by pressure exerted on one side or the other of its planar face said jaws being releasable.

3,863,302
APPARATUS FOR ANCHORING WIRES OR STRANDED WIRES
Gerard Welbergen, Zumikon, and Hans Rudolf Seigwart, Kilchberg, both of Switzerland, assignors to Bureau BBR Ltd., Zurich, Switzerland
Filed Oct. 10, 1973, Ser. No. 404,989
Claims priority, application Switzerland, Oct. 16, 1972, 15074/72
Int. Cl. F16g 11/04
U.S. Cl. 24—122.6 7 Claims



1. An apparatus for anchoring wires or stranded wires equipped with an anchor plate having throughppassage bores for said wires or said stranded wires, and which plate has associated therewith clamping wedge means for anchoring the wires or stranded wires, each throughpassage bore possessing at one end a substantially conical recess for receiving the clamping wedge means and subsequently merging substantially cylindrical section, the improvement comprising means for applying the clamping wedge means, during the application of the apparatus to the wires or stranded wires and during the tensioning thereof, against a press-in plate which is located in spaced relation from the anchor plate, said press-in plate being equipped with openings for the throughpassage of the wires or stranded wires, said applying means holding the clamping wedge means out of their effective clamping position, and after tensioning of the wires or stranded wires said press-in plate being displaceable against the anchor plate for simultaneously and uniformly bringing the wedges into their clamping position.

3,863,303
CONNECTOR BUCKLE
Daniel A. Armstrong, Utica, and Michael A. Pocobello, Warren, both of Mich., assignors to American Safety Equipment Corporation, New York, N.Y.
Filed Nov. 9, 1973, Ser. No. 414,384
Int. Cl. A44b 11/12
U.S. Cl. 24—193 4 Claims



1. In a device for connecting webbing to a buckle including a buckle body with limiting means mounted thereto, and cam means mounted on said buckle body, said cam extending longitudinally for engaging the width of the webbing between

itself and the limiting means, the improvement comprising the provision of:

first supporting means on said buckle body for supporting one longitudinal end of said cam means for pivoting movement about its longitudinal axis and permitting movement of said longitudinal axis through an arcuate path;

second supporting means associated with said buckle body and movable between a first position for supporting said other longitudinal end of said cam means for pivoting movement of said cam means about said longitudinal axis and preventing arcuate movement of said longitudinal axis of said cam and to a second position releasing said end of said cam and permitting the axis to move in said arcuate path whereby when said second supporting means is in its second position, said webbing being insertable between said cam and said limiting means when said cam is moved in an arcuate path, and when said second supporting means is in its first position, said webbing is prevented from being removed from between said cam and limiting means whereby pulling on an end of the webbing causes said webbing to pivot said cam means about said longitudinal axis to grip the webbing between said limiting means and said cam means.

3,863,304

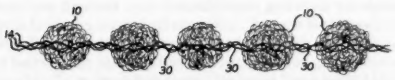
LINEAR FASTENING ELEMENT AND METHOD THEREFORE

George C. Brumlik, Montclair, N.J., assignor to Ingrip Fasteners Inc., New York, N.Y.

Continuation of Ser. No. 126,706, March 22, 1971, abandoned. This application Aug. 8, 1973, Ser. No. 386,676

Int. Cl. A44b *11/25, 17/00*

U.S. Cl. 24—204 **21 Claims**



1. Linear fastening element comprising a plurality of filament clusters each of said clusters being a discrete porous particle aggregate containing one or more intertwined filaments and being adapted to permit a gripping member to enter the interior thereof and to reversibly retain and hold said gripping member therein by filament engagement, said filament clusters being interconnected by a linear member passing through successive clusters.

3,863,305

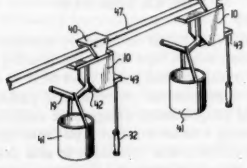
BREAK-AWAY TROLLEY HOOK

Robert J. Jaarsma, c/o Natmar Inc., 4026 Cherry St., Cincinnati, Ohio 45223

Filed Apr. 25, 1974, Ser. No. 463,968

Int. Cl. B65g *17/20;* **B66c** *1/34*

U.S. Cl. 24—230.5 SS **10 Claims**



1. A break-away hook apparatus to selectively carry and discharge loads comprising:

first and second spaced side plates,

a hook rotatably mounted about a first pivot point between the first and second side plates, the position at which a load is carried by the hook being eccentric of the pivot point,

a trip lever rotatably mounted about a second pivotal axis between the first and second plates,

the trip lever having a first position wherein it abuts the hook in the region between the first pivot point and a load carried by the hook to fix the position of the hook and prevent it from rotating about the first pivot point towards its position of stable equilibrium whereby the load is retained on the hook,

first means connected to the trip lever to actuate the trip lever about the second pivot point to a second position wherein the hook is enabled to rotate about the first pivot point under the force of a load carried thereby until a condition of stable equilibrium is reached whereat a load carried by the hook will be discharged by sliding off the hook.

3,863,306

PIVOTABLE MOUNTING CLIP

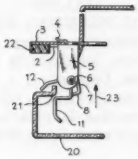
Bernard C. Duchatellier, Paris, France, assignor to Rapid S. A., Paris, France

Filed Mar. 7, 1973, Ser. No. 338,780

Claims priority, application France, Apr. 13, 1972, 72.13000

Int. Cl. A44b *21/00;* **F21v** *17/00*

U.S. Cl. 24—252 B **14 Claims**



1. A two-piece clip for releasably mounting a first object having an inwardly extending flange to a second object, said clip comprising:

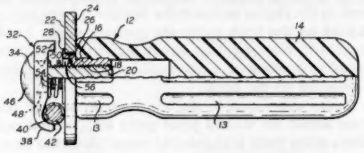
a stirrup member mountable to said second object, said stirrup member including a pair of substantially parallel arms and an integral resilient positioning means; and

a generally V-shaped angle member pivotably mounted to said stirrup member, said angle member comprising a first and second leg and a shaft extending from each side of the angle member at the tip of the V, each shaft being received in an aperture of an arm of said stirrup member, said angle member having a first position for receiving the flange of the first object between the legs of the V and a second position for resiliently urging said flange against said second object, in the first position of said angle member said first leg engaging said resilient positioning means and said second leg providing a surface against which said flange may act as a result of said first object being urged towards said second object to pivot said angle member and in the second position of said angle member said first leg resiliently urging said flange against said second object and said second leg resiliently engaged by said resilient positioning means to maintain said angle member in said second position.

3,863,307
WIRE GRIPPING APPARATUS

Ignazio Leonardo, Mountainside, N.J., assignor to General Cable Corporation, New York, N.Y.

Filed June 25, 1973, Ser. No. 372,923
Int. Cl. A44b 21/00
U.S. Cl. 24—263 A **3 Claims**

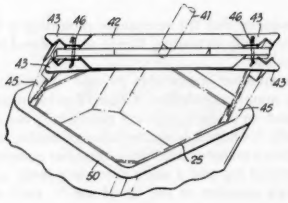


1. A wire gripping apparatus comprising a handle portion, a face at one end of the handle portion, a clamp section having a cable gripping surface confronting said face, and mechanism that moves the clamping section toward and from said face when the handle is rotated in different directions with respect to the clamp section, characterized by the face at one end of the handle being a plate, a bearing on which the plate and other portions of the handle are rotatable with respect to one another whereby the other portions of the handle can be rotated while the plate remains stationery and in contact with the cable that is being gripped, and further characterized by the face plate being generally annular with an inner cylindrical face that provides a bearing that contacts with a circumferential surface of the handle, the handle including a bushing that extends from one end of the handle, the handle having said circumferential surface on the bushing, and having thrust bearing surfaces on both sides of the face plate, one thrust bearing surface being a flange of the bushing and the other a shoulder on the handle.

3,863,308
HOT TOP INSERTING METHOD

Kenneth Thomas Eccleston, and Roger Fieldhouse, both of Birmingham, England, assignors to Foseco International Limited, Birmingham, England

Division of Ser. No. 260,439, June 7, 1972, Pat No. 3,815,664.
This application Mar. 22, 1974, Ser. No. 453,958
Claims priority, application Great Britain, June 16, 1971, 28244/71
Int. Cl. B22d 7/10
U.S. Cl. 29—525 **1 Claim**

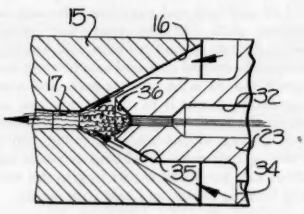


1. In the method of lining the head of an ingot mould or a head box therefor with a lining of refractory heat insulating material the improvement which comprises locating slabs of refractory heat insulating material on an expansible frame, locating on a holder associated with the said frame one or more wedges of refractory heat insulating material, the slabs and wedges together constituting a complete hot top, lowering the assembly of frame and holder so that the frame enters an ingot mould or head box, expanding the frame to urge the lining slabs into contact with the mould or head box wall, moving the holder downwardly to drive the wedges between adjacent edges of the lining slabs to so form and secure a complete hot-top within the mould or head box, contracting the frame and removing the frame and holder from the ingot mould or head box.

3,863,309
YARN TEXTURING AIR JET

Samuel T. Price, Kennedyville, Md., assignor to Enterprise Machine and Development Corporation, New Castle, Del.

Filed Jan. 25, 1974, Ser. No. 436,532
Int. Cl. D02g 1/16
U.S. Cl. 28—1.4 **6 Claims**



1. In a yarn texturing air jet of the type including an elongate housing having a central bore therethrough, a venturi supported in the central bore and in the exit end of said housing, an inwardly tapering conical surface on the inner end of said venturi and terminating in an exit orifice extending through the exit end of said venturi, a yarn guiding needle positioned in the central bore of said housing and having an inner end portion positioned closely adjacent said inwardly tapering conical surface on the inner end of said venturi, said needle having an axial yarn guiding channel extending therethrough for directing multifilament yarn through said needle and toward said venturi, said inwardly tapering conical surface of said venturi defining the exit end of a turbulence chamber, and means for directing pressurized gas into the central bore of said housing and along said inner end portion of said needle whereby the gas passes through said turbulence chamber and outwardly through said exit orifice of said venturi to impart crimps, curls and loops to the filaments as the yarn passes through said turbulence chamber; the combination therewith of means for improving the turbulence and enhancing the crimps, curls and loops imparted to the yarn in said turbulence chamber, said means comprising a conical opening extending from the inner end of said needle and inwardly toward the entrance end and terminating at the yarn guiding channel extending through said needle whereby the entrance end of said turbulence chamber is defined by said conical opening in the inner end of said needle.

3,863,310
PROCESS FOR PRODUCING COLORED PATTERNS IN EMBROIDERY MACHINES

Arnold Ochsner, Harriman, N.Y. 10926

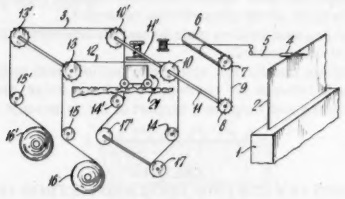
Continuation-in-part of Ser. No. 848,840, Aug. 11, 1969, abandoned. This application May 12, 1971, Ser. No. 142,520
Int. Cl. D05c 3/04
U.S. Cl. 28—77 **5 Claims**

1. In a Schiffli type shuttle embroidery machine controllable by a programmed design tape of the Jacquard type, a process for producing multi-colored yarns insertable in said machine for producing multi-colored embroidered patterns in accordance with said programmed design tape comprising,

a. programming a color control tape from the design tape according to the color variations in said design,

b. inserting the programmed color tape in a dye-control system which system consists of a multi-colored dye source and controls therefor responsive to the programmed color tape,

c. playing the programmed color tape with the control system to control the distribution of each of the colored dyes upon the yarn being dyed in a continuous manner until the yarn length is equal to the linear length of the pattern being embroidered upon the material being applied, and



d. inserting the colored yarn into the Schiffli machine in the sequence for the original start of the pattern being sewed and, thereafter, operating the machine so as to complete the original colored pattern.

3,863,311
PACKAGE TAKE-UP CONTROL FOR STUFFER BOX CRIMPERS

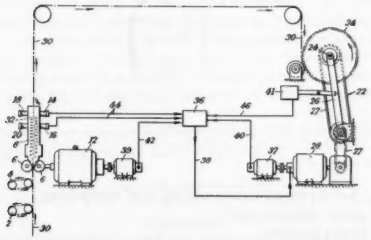
Albert Joseph Cartlidge, and Frank Shuttleworth, both of Bolton, England, assignors to Platt International Limited, Lancashire, England

Filed Jan. 30, 1973, Ser. No. 327,923

Claims priority, application Great Britain, Jan. 31, 1972, 4465/72

Int. Cl. D02g 1/12

U.S. Cl. 28—1.7 **5 Claims**



1. A stuffer box crimping machine comprising a stuffer box, feed means for supplying yarn to the stuffer box to form a plug of yarn therein, a take-up device arranged to withdraw yarn from the stuffer box and to form the yarn into a package, a D.C. motor arranged to drive the take-up device, detector means arranged to produce a level-dependent electrical output in dependence on the level of the plug of yarn in the stuffer box, a diameter sensor for sensing the diameter of the package and arranged to provide a diameter-dependent electrical output dependent on the diameter of the package, a speed sensor operative to detect the rate at which yarn is fed to the stuffer box by the feed means and to provide a feed-dependent electrical output in dependence on the detected rate, and control means arranged to receive the level-dependent electrical output, the diameter-dependent electrical output and the speed-dependent electrical output and being operative to control the rotational speed of the D.C. motor whereby the plug of yarn in the stuffer box is maintained between predetermined limits in dependence on the said electrical outputs.

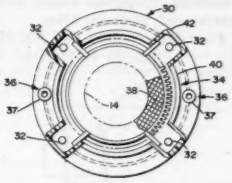
3,863,312
METHOD OF MOUNTING A DEFLECTION YOKE ASSEMBLY

Floyd E. Aldrich, Waterloo, and Fred A. Hovey, Geneva, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 415,717, Nov. 14, 1974, Pat. No. 3,829,804. This application Apr. 24, 1974, Ser. No. 463,540

Int. Cl. H01j 9/18

U.S. Cl. 29—25.13 **1 Claim**



1. In a method of mounting a deflection yoke assembly in operable relation upon a cathode ray tube having a rear wall and a cylindrical neck extending therefrom, the steps comprising: positioning an annular tube ring against said rear wall of said tube in a position substantially centrally located with respect to and surrounding said neck, said annular tube ring having a circumferential wall containing first means for supporting a yoke retainer ring and second means for mounting said annular tube ring to said rear wall of said cathode ray tube, said first and second means being separate and distinct and projecting from said circumferential wall in a direction substantially parallel to said tube neck, said second means being formed with an adhesive passage which communicates with an internal hollow groove formed in said tube ring; positioning a yoke retainer ring, having a circumferential wall containing a plurality of hollow pockets, over said tube neck so that said first means are encompassed within said pockets, said pockets having a substantially closed bottom containing an opening therein; and dispensing a hardenable adhesive simultaneously through said openings in said bottoms and said adhesive passages in said second means, whereby said annular tube ring is bonded to said rear wall of said cathode ray tube and said yoke retainer ring is bonded to said annular tube ring.

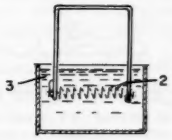
3,863,313
MANUFACTURE OF SUBMINIATURE INCANDESCENT LAMPS

Stephen F. Kimball, Georgetown, and Paul E. Gates, Danvers, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed June 7, 1973, Ser. No. 367,807

Int. Cl. H01j 9/18

U.S. Cl. 29—25.15 **1 Claim**



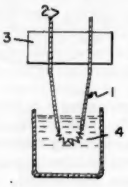
1. In the process of manufacturing a single ended subminiature incandescent lamp, the steps which sequentially comprise: helically coiling a length of fine tungsten wire on a mandrel wire having a larger diameter; heat treating the coiling; connecting a predetermined length of the coiling across the ends of a U shaped support wire, said predetermined length comprising a lamp filament; immersing said filament

into acid to dissolve the mandrel therein; inserting the filament into an open ended glass tube; heating and press sealing one end of the glass tube onto a portion of the legs of the support; sealing the other end of the glass tube; and removing the middle section of the support so that each leg thereof comprises a lead-in wire for the filament.

3,863,314
METHOD OF MANUFACTURING MINIATURE INCANDESCENT LAMPS

Bernard Kopelman, Magnolia, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed June 7, 1973, Ser. No. 367,819
Int. Cl. H01j *9/18*
U.S. Cl. 29—25.15 **1 Claim**

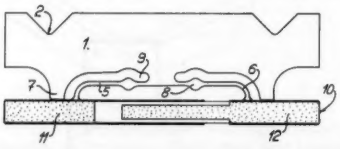


1. In the process of manufacturing a single ended subminiature incandescent lamp, the steps which sequentially comprise: helically coiling a length of fine tungsten wire on a mandrel wire having a larger diameter; heat treating and cutting the coiling into predetermined lengths; bending each of the cut lengths into a hairpin shape; attaching the ends of the hairpin to a temporary support; dissolving part of the mandrel at the apex end of the hairpin; inserting the hairpin into an open ended glass tube; heating and press sealing one end of the glass tube onto a portion of the legs of the hairpin, said portion still containing mandrel wire; sealing the other end of the glass tube and removing the temporary support to form a finished lamp.

3,863,315
PROCESS FOR THE MANUFACTURE OF A PIEZOELECTRIC SUSPENSION DEVICE

Gerald Jenni, Peseux, Switzerland, assignor to Oscilloquartz S.A., Neuchatel, Switzerland

Filed June 25, 1973, Ser. No. 373,265
Claims priority, application Switzerland, July 7, 1972, 10179/72
Int. Cl. B01j *17/00*
U.S. Cl. 29—25.35 **5 Claims**

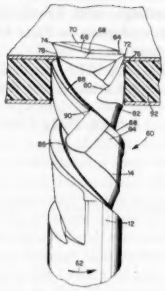


1. A process for the manufacture of a piezoelectric resonator suspension device comprising the steps of:
a. forming a comb-piece from a thin metal plate,
b. forming positioning means in the thin metal plate for positioning same in a jig,
c. forming at least one connection in the comb-piece, said connection having an end part forming a stub and a flexible spring-like portion connecting said connection to the comb-piece and a bulge being provided in said flexible spring-like portion in proximity to where said portion joins the comb-piece,
d. providing a welding plate on said stub,
e. positioning said comb-piece by means of said positioning means in said jig and positioning a said resonator in said jig so that said stub equipped with said welding plate comes to bear against a predetermined point on one electrode of the piezoelectric resonator.
f. welding said welding plate to said predetermined point on said one electrode,
g. parting said flexible spring-like portion from said comb-piece between the comb-piece and said bulge, and
h. welding said bulge to a support of the suspension device.

3,863,316
ROTARY CUTTING TOOL AND METHOD OF MANUFACTURING SAME

Herbert G. Yeo, Limerock Ave., Lincoln, R.I. 02865

Filed Dec. 7, 1973, Ser. No. 422,975
Int. Cl. B26d *1/12*
U.S. Cl. 29—103 A **6 Claims**



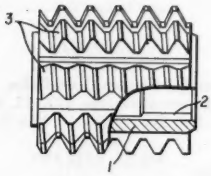
1. An improved rotary cutting tool comprising:
a shank portion; and
a fluted portion;
said fluted portion having a first double helical cutting edge means beginning at said shank portion and extending forward around said fluted portion in one direction to a point adjacent to but short of the end of said fluted portion and comprising first double helical parallel cutting edges on lands spaced by first double helical parallel flutes;
said fluted portion having a second double helical cutting edge means extending around said fluted portion in the other direction from the end of said fluted portion toward said shank portion to a point closer to said shank than is the forward termination of said first double helical cutting edge means and comprising second double helical parallel cutting edges on lands spaced by second double helical parallel flutes;
whereby the rearward end of said second double helical cutting edge means longitudinally overlaps the forward end of said first double helical cutting edge means; the flute of each of said second double helical cutting edge means extending through one cutting edge land and at least into the next cutting edge land of said first double helical cutting edge means.

3,863,317

HOB

Hiroshi Taniguchi, Akashi, and Tatuo Tanimoto, Kakogawa, both of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Continuation-in-part of Ser. No. 267,417, June 29, 1972, abandoned. This application May 30, 1974, Ser. No. 474,545
Int. Cl. B26d *1/12*
U.S. Cl. 29—103 B 11 Claims



1. A hob comprising:

a cylindrical body portion having a longitudinal axis; and

tooth elements arranged in succession along a helical line extending around said longitudinal axis of said hob wherein the shoulder portions of the trailing sides of some of said tooth elements are reduced from their basic contour,

said reductions extending from the top end surfaces of said tooth elements to positions along said trailing sides which are disposed within the range of 0.6 – 1.0 modules, the intersecting angle, as measured in degrees, between the basic contour and a line tangent to said reduced contour at a position of 0.5 module being greater than two times the number of starts upon said hob, and wherein the leading sides of said tooth elements relative to the symmetric line of the basic contour of said elements, are unmodified,

whereby said reduced trailing sides of said tooth elements do not engage in the cutting operation.

3,863,318

HIGH TEMPERATURE-RESISTANT WEARPROOF SINTERED ALLOYS

Itaru Niimi, Nagoya; Kametaro Hashimoto, Toyota; Kenji Ushitani, Toyota; Yoichi Serino, Toyota; Tetsuya Suganuma, Toyota; Seishu Mitani, Kyoto, and Kunizo Imanishi, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan

Filed Mar. 1, 1973, Ser. No. 336,945
Claims priority, application Japan, Mar. 6, 1972, 47-22969
Int. Cl. B22f *1/00*
U.S. Cl. 29—182 10 Claims

1. High temperature resistant, wear-resistant sintered alloy consisting essentially of:

3–20% by weight of molybdenum,

0.5–1.5% by weight of carbon,

3–25% by weight of cobalt,

1–15% by weight of lead, and

balance mainly iron,

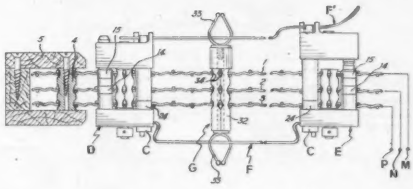
said alloy being in the form of particles consisting essentially of molybdenum and iron, said particles being several tens of microns in size and having a Vickers hardness of 600–1,300, and lead, dispersed in an iron-based matrix softer than said molybdenum-iron particles.

3,863,319

PROCESS AND EQUIPMENT FOR THE MANUFACTURE OF WIRING HARNESSES AND SIMILAR COMPONENTS

Bernard Pellet, 23 Blvd. da la Corne d'Or, Villefranche-sur-Mer, France

Filed Apr. 3, 1973, Ser. No. 347,497
Int. Cl. H05k *13/06*
U.S. Cl. 29—203 MW 14 Claims



1. An apparatus for manufacturing wiring harnesses, said apparatus comprising, in combination:

semitransparent board means providing two oppositely disposed surfaces, one of said surfaces being adapted for placement of a pattern harness thereon, the other of said surfaces being adapted for the placement and assembly thereon of the wiring harness to be manufactured in superposed relationship with respect to the pattern harness which is viewed through the board means;

terminal block means disposed through said board at locations defining start and finish terminal blocks for the end points of each conductor of the pattern harness, each terminal block means having terminals thereon extending to opposite sides of said board means for connection to the same respective end of a conductor of the pattern harness and the respective conductor harness to be manufactured;

controllable illuminating means disposed on each terminal block means so as to provide a visual signal; and

circuit means connected to each terminal block means and to said controllable illuminating means and including change-over switch means integral with said terminal block means, said circuit means being automatically responsive;

1. to the connection of each end of a conductor of the pattern harness to the terminals of a respective start and finish terminal block to effect illumination of said respective start and finish terminal block with a visual signal, and
2. to the connection of an end of a conductor of the wiring harness to be manufactured to the terminal of said respective start terminal block to effect extinguishment of said visual signal at said respective start terminal block and modification of said visual signal at said respective finish terminal block, and
3. to the connection of the other end of said conductor of the wiring harness to be manufactured to the terminal of the respective finish terminal block to effect extinguishment of said modified visual signal.

3,863,320

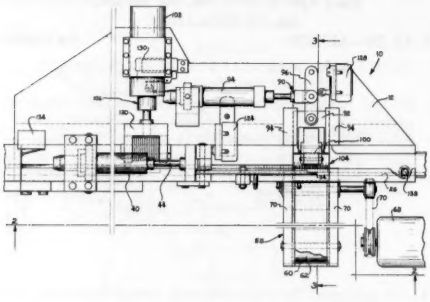
SUBSTRATE LOADER

Robert W. De Lisle, Dover, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 15, 1973, Ser. No. 388,363
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 B 7 Claims

1. A substrate loading apparatus for attaching a selected number of terminals to one side of a flat ceramic substrate or like member comprising: a terminal feed path, means for periodically moving a terminal strip along the feed path to position a number of terminals at a loading zone adjacent the feed path, first substrate feeding means for moving flat sub-

strates laterally to a first position located to one side of the loading zone, second substrate feeding means for lifting the substrate to a second position immediately adjacent said loading zone with one edge of the substrate adjacent the terminals



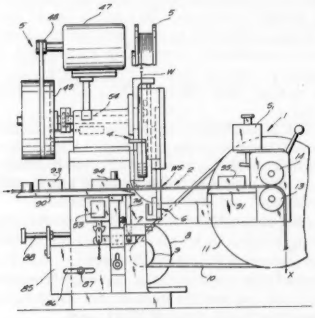
in the loading zone, and substrate pushing means engagable with an opposite edge of a substrate to move the substrate from said second position toward and into engagement with the terminals.

3,863,321

METHOD AND APPARATUS FOR AUTOMATICALLY ATTACHING TOP STOPS TO A CONTINUOUS SLIDE FASTENER CHAIN

Morris Perlman, Brooklyn, N.Y., assignor to Carbide Form Grinding, Inc., Brookyln, N.Y.

Filed Oct. 4, 1973, Ser. No. 403,715
Int. Cl. B23p *19/04, 11/00*
U.S. Cl. 29—207.5 ST **14 Claims**



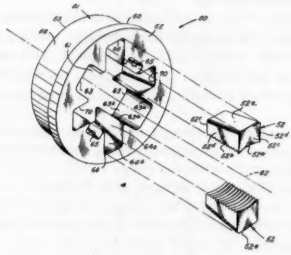
1. Automatic top stop attaching machine for attaching two top stops to each of successive portions of a continuous slide fastener chain which comprises two tapes, bottom stops, connectingg the two tapes at longitudinally spaced portions to each other, rows of interengaging coupling elements provided on facing edges of the tapes, and a slider on each of the portions for engaging and disengaging the coupling elements and providing between the slider and the following bottom stop a gap in which the tape portions are disconnected from each other, said machine comprising means for feeding the slide fastener chain intermittently in one direction and substantially in one plane to and past a working station; means for feeding two wires from opposite sides to said working station; combined cutting, bending and clamping means at said working station for cutting off portions from the two wires, for bending the cut-off wire portions into substantially U-shaped configuration, for holding the same in a predetermined position and for subsequently clamping the bent wire portions onto edges of said tapes closely adjacent to the coupling elements on one end of the rows of coupling elements; means for reciprocating said combined cutting, bending and clamping means in a direction transverse to said one direction; means for deflecting the tapes in the region of said working station for bringing the facing edges thereof in proper position for clamping the bent wire portions thereon; means for moving the chain longitudinally in a direction opposite to said one direction to bring the coupling elements on said one end of said rows of coupling elements closely adjacent to said bent wire portions before the latter are clamped to the edges of said tapes; and control means for automatically actuating the aforementioned means in proper sequence.

3,863,322

PULLING TOOL

Curtis J. Russell, 9344 Haven Cove, Dallas, Tex. 75227

Continuation-in-part of Ser. No. 123,152, March 11, 1971, Pat. No. 3,748,718. This application May 21, 1973, Ser. No. 362,362
Int. Cl. B23q *3/08*
U.S. Cl. 29—283 **2 Claims**

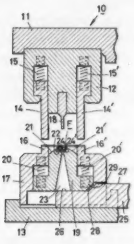


1. A pulling tool for removing a sleeve-type hub from a shaft comprising: a pulling ring adapted to be supported concentrically over said hub in spaced relation thereto to define an opening within said ring around said hub, said pulling ring having external peripheral pulling flange for engagement of said ring by a puller arm for applying a force to said pulling flange substantially parallel with a longitudinal axis of said hub; said pulling ring further having a plurality of pairs of diametrically opposed internal circumferentially spaced longitudinal slots, the bottom seat surfaces of each said pairs of slots being at a different distance from the axis of said pulling ring from all other pairs of said slots in said pulling ring, said seat surfaces sloping longitudinally along said pulling ring convergently toward the axis of said pulling ring in a direction away from said pulling flange; and a pair of jaw segments, each of said jaw segments having a generally cylindrical internal gripping surface adapted to engage said hub for pulling said hub from said shaft and a tapered external surface adapted to seat on one of said bottom seat surfaces of said longitudinal slots of said pulling ring whereby each of said jaw segments is wedged between said pulling ring and said hub responsive to a force applied to the back face of said flange on said pulling ring, said jaw segments being selectively positionable in each of said pairs of said slots at different distances from said axis of said pulling ring to accommodate said tool to different hub sizes, and said jaw segments when assembled in said pulling ring occupying less than 360° of the space between said hub and said pulling ring.

3,863,323
METHOD AND RELATED APPARATUS FOR FORMING AN ELEMENT-FREE GAP IN A CONTINUOUS SLIDE FASTENER CHAIN

Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 31, 1973, Ser. No. 384,177
Claims priority, application Japan, Aug. 7, 1972, 47-79005
Int. Cl. B23p 11/00, 19/04
U.S. Cl. 29—408 6 Claims

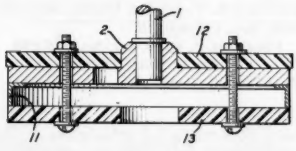


1. A method of forming an element-free gap in a continuous slide fastener chain having a pair of oppositely disposed stringer tapes each carrying along their adjacent longitudinal edges a row of fastener elements whose coupling parts are interengaged, which method comprises gripping the stringer tapes at points opposite to the rows of fastener elements, causing the interengaged parts of the fastener elements to pivot on themselves in a direction opposite to each other about a longitudinal axis of the pair of stringer tapes to spread apart the adjacent tape edges widely enough to expose therebetween said interengaged parts, and cutting the thus exposed interengaged parts off of the fastener chain along a length corresponding to a desired gap to be formed.

3,863,324
METHOD FOR FORMING AN EDGE-SUPPORTED ANNULAR MAGNETIC RECORDING MEDIUM

Robert A. Ehrhardt, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, New York, N.Y.

Filed June 24, 1954, Ser. No. 439,080
Int. Cl. B23p 17/00
U.S. Cl. 29—423 6 Claims

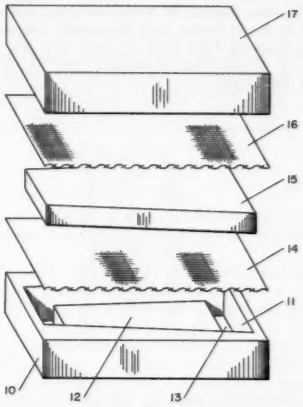


1. In a recording and reproducing apparatus employing a magnetizable tape secured at one marginal edge thereof to the peripheral surface of a circular member of nonmagnetic material, the method of forming said magnetizable tape on said circular member which comprises attaching to a lateral face of said circular member a ring of metal, machining the peripheral surfaces of said circular member and said attached metal ring in a single operation to form coextensive peripheral surface areas, applying a plating of magnetizable material to the peripheral surface areas of said member and of said ring and thereafter removing said metal ring to leave a width of magnetizable material attached to and overhanging one edge of said circular member.

3,863,325
GLASS CLOTH IN METAL FORGING

Thomas B. Gurganus, Avon, and Leland L. Grubb, Parma, both of Ohio, assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed May 25, 1973, Ser. No. 363,930
Int. Cl. B23p 17/00
U.S. Cl. 29—423 16 Claims

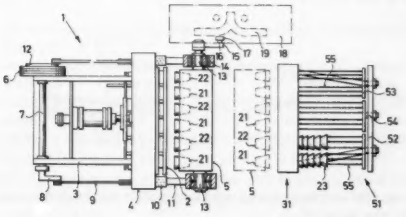


1. A method of forging a metal piece between dies, comprising the steps of heating the metal piece to a temperature above that of the dies, insulating the higher temperature metal piece from the dies with glass cloth, squeezing the insulated metal piece between the dies for causing metal flow for forging, and during said squeezing and forging step, maintaining said cloth in its original filamentary condition so that following squeezing and forging the individual filaments of the glass cloth are still visible.

3,863,326
DEVICE FOR MANUFACTURING DOUBLE-WALLED CUPS

Wilhelm Haberle, Industriegelande, Scheer/Wurttemberg, Germany

Filed Jan. 18, 1973, Ser. No. 324,782
Claims priority, application Germany, Jan. 20, 1972, 2202624
Int. Cl. B23p 19/04
U.S. Cl. 29—208 F 8 Claims



1. A device for manufacturing double-walled cups from thermoplastically deformable sheets, each cup being composed of an outer cup and an inner cup, said device comprising:

a. a molding station having tools for simultaneously manufacturing both outer and inner cups; and

b. a removal device associated with said molding station, means for ejecting the cups from said molding station into said removal device and by means of which an associated

pair of inner and outer cups is fed by said molding station, said removal device being formed of at least one disk rotatably journaled and capable of being driven, and a plurality of inserts in each of said disks operable for receiving the outer or inner cups.

3,863,327

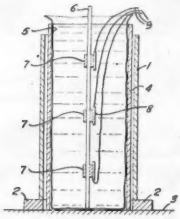
METHOD OF LINING METAL PIPES

Roland Arthur Legate, 30 Whitecrafts St., and Kevin Strickland, 28 Hazel Grove, both of Stotfold, Hitchin, England

No Drawing. Filed Dec. 27, 1972, Ser. No. 318,729

Int. Cl. B23k *21/00*

U.S. Cl. 29—470.1 **10 Claims**



1. A method for internally lining a metal pipe said method comprising (i) positioning a metallic liner inside a pipe in a gaseous atmosphere, (ii) maintaining the volume within the liner full of a liquid, (iii) setting up at least three explosive charges in the liquid along the central axis of the pipe, (iv) simultaneously firing the explosive charges, the explosive charges being located such that initially the liner forms a tight mechanical bond with the pipe in the central region of the pipe, and carrying out subsequent firings to drive the gas from between the liner and the pipe so that the liner forms a tight mechanical bond with the pipe along the length of the pipe.

3,863,328

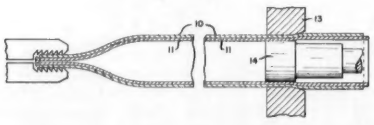
METHOD OF MAKING A COMPOSITE STEEL TUBING

John J. Arntz, Shelby, Ohio, assignor to Copperweld Steel Company, Shelby, Ohio

Continuation of Ser. No. 295,993, Oct. 10, 1072, abandoned, which is a continuation-in-part of Ser. No. 126,633, March 22, 1971, abandoned. This application Jan. 22, 1974, Ser. No. 435,526

Int. Cl. B21d *39/00*; B23p *11/00*

U.S. Cl. 29—516 **14 Claims**



6. The method of making a composite steel tubing comprising the steps of:

a. providing two sections of welded steel tubing of substantially equivalent wall thickness, one of which sections has an outer diameter less than the inner diameter of the other;

b. telescoping said tubing sections and holding them together at one end;

c. changing the diameter of one of said tubing sections so as to produce a mechanical bond therebetween; and

d. cold drawing the united tubing sections through a sizing die and over a mandrel.

3,863,329

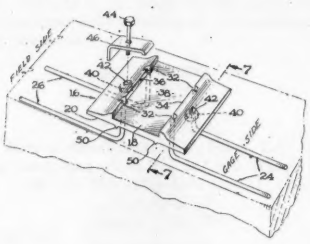
METHOD OF MAKING PRECAST RAILROAD TIE AND TIE PLATE

Jamie S. Bartlett, 6927 Green Hill Pl., Tampa, Fla. 33617

Division of Ser. No. 316,567, Dec. 19, 1972, Pat. No. 3,834,620. This application Nov. 30, 1973, Ser. No. 420,458

Int. Cl. E01b *3/32*

U.S. Cl. 29—471.3 **9 Claims**



1. A method of making a precast reenforced rail tie and tie plate combination, of which the tie is formed of an initially cementious or plastic material, including the steps of:

a. disposing an elongated mold form of a generally U-shape cross-section in a horizontal position with the open side upward to receive the cementious material;

b. positioning within the form a first plurality of spaced-apart elongated reenforcing rods of a length extending substantially from end to end of the rail tie being cast in said mold form;

c. positioning a pair of opposed rail tie plates including combined transversely projecting anchor and reenforcing rods thereon constituting in part a second plurality of reenforcing rods, at the bottom of the open form in laterally opposed relation so that the projecting combined anchor and second plurality of reenforcing rods are generally medially disposed within said form and do not touch those of the other laterally spaced plate or those constituting said first plurality of reenforcing rods; and

d. filling said form with a setable cementious material and leveling said material substantially flush with the open top of said form.

3,863,330

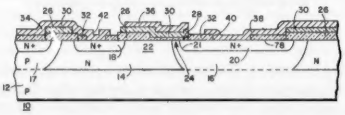
SELF-ALIGNED DOUBLE-DIFFUSED MOS DEVICES

Albert V. Kraybill, Arlington Heights; William Rapshys, Palatine, and Francis R. Yester, Des Plaines, all of Ill., assignors to Motorola, Inc., Chicago, Ill.

Filed Aug. 2, 1973, Ser. No. 385,139

Int. Cl. B01j *17/00*

U.S. Cl. 29—571 **5 Claims**



1. A method of making a double-diffused MOSFET semiconductor device comprising the steps of:

forming a first insulating layer on a first surface of a substrate of semiconductor;

forming a first opening in said first insulator exposing said substrate;

forming a second insulating layer on said first insulating layer and on said exposed substrate;

forming a second opening in said second insulating layer, exposing said first insulating layer;

removing said exposed first insulating layer, exposing said first surface;

forming a first region in said substrate through said second opening, said first region being of a first conductivity type, and extending a first predetermined distance under said second insulating layer in said first layer;

forming a third opening in said first and second insulating layers, exposing said substrate;

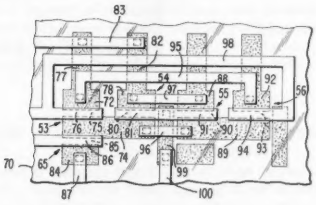
forming second and third regions of a second conductivity type in said substrate at said first surface, said second region being formed in said first region through said second opening and extending a second predetermined distance under said second insulating layer, said first region being driven in further to extend a third predetermined distance under said second insulating layer, said second predetermined distance being less than said third predetermiend distance, and said third region being formed external to said first region through said third opening; and

forming a conductive gate electrode on said second insulating layer over said first opening, said second predetermined distance being selected to minimize the capacitance between said conductive gate electrode and said second region while providing reliable operation of said double-diffused MOSFET devices, said third predetermined distance being selected to provide an optimized channel length.

3,863,331
MATCHING OF SEMICONDUCTOR DEVICE CHARACTERISTICS

Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation

Filed Sept. 11, 1972, Ser. No. 287,863
Int. Cl. B01j *17/00*
U.S. Cl. 29—577 **4 Claims**



1. A method of making an electrical circuit which includes a pair of circuit elements having closely matched characteristics comprising:

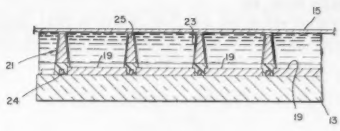
forming, by photolithographic processes using at least one photomask, two pairs of subelements, each pair including a first subelement and a second subelement, said first subelements being made by using a pair of separate patterns on said photomask, each of said first pair of separate patterns on said photomask being made from a first pattern on a master, said second subelements being made by using a second pair of separate patterns on said photomask, each of said second pair of said separate patterns being made from a second pattern on said master, and

connecting the first subelement of one pair with the second subelement of the other pair and the second subelement of said one pair with the first subelement of the other pair.

3,863,332
METHOD OF FABRICATING BACK PANEL FOR LIQUID CRYSTAL DISPLAY

Alex M. Leupp, Newport Beach, and Hans G. Dill, Costa Mesa, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed June 28, 1973, Ser. No. 374,444
Int. Cl. B01j *17/00*
U.S. Cl. 29—580 **3 Claims**



1. A method of fabricating a backplate with electrodes and integrated spacers for a liquid crystal display comprising the steps of:

a. forming an array of reflective electrodes in spaced apart columns and rows on a surface of a substrate,

b. depositing an oxide layer on said surface and over said electrodes,

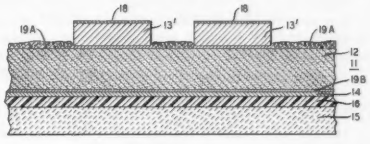
c. depositing an aluminum layer over said oxide layer, and

d. forming a two-layered lattice extending from the spaces between said columns and rows of electrodes by removing those portions of said layers which are over the central portions of said electrodes and anodizing the aluminum portions of said two-layered lattice prior to removing the portions of the oxide layer.

3,863,333
METHODS FOR MAKING SEMICONDUCTOR DEVICES

Andrew Loya, Irvington, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 31, 1973, Ser. No. 393,596
Int. Cl. B01j *17/00*
U.S. Cl. 29—578 **13 Claims**



1. A process for making semiconductor devices comprising the steps of:

forming a first thin layer of gold on one side of a silicon wafer;

forming a platinum-silicide layer on the other side of the wafer;

forming a second layer of gold over the platinum-silicide layer;

defining a plurality of devices by etching porions of the second gold layer, thereby to expose part of the platnium-silicide layer;

subjecting the exposed platinum-silicide layer to a silicon etchant, thereby to weaken its structure;

immersing the wafer in a liquid and subjecting it to ultrasonic agitation of sufficient intensity to remove the exposed and weakened platinum-silicide, thereby to expose part of the silicon wafer;

subjecting the exposed silicon to a silicon etch for a sufficient time to etch through the wafer to the first thin layer of gold, whereby a plurality of defined devices are held together by the first layer; and

immersing the wafer in a liquid and subjecting it to ultrasonic agitation of sufficient intensity to rupture the thin gold layer, thereby to break apart the defined devices.

3,863,334

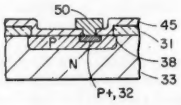
ALUMINUM-ZINC METALLIZATION

Michael G. Coleman, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 121,708, March 8, 1971, abandoned. This application May 7, 1973, Ser. No. 358,180

Int. Cl. B01j *17/00*

U.S. Cl. 29—590 **7 Claims**



1. A method for making an ohmic contact to a region of semiconductor comprising the steps of:

forming an insulating layer on a surface of a first region of semiconductor, said first region of semiconductor being of a first conductivity type;

forming an opening in said insulating layer, exposing said surface;

forming a metal layer on said insulating layer and on said exposed surface, said metal layer including a first metal and a second metal, such that impurity ions of said second metal are of said first conductivity type and the entectic between the semiconductor and the first metal being higher than the entectic between the semiconductor and the second metal, diffusing ions of said second metal through said exposed surface into said first region of semiconductor, by heating to a temperature below the entectic between the semiconductor and the first metal, thus forming a relatively heavily doped second region of said first conductivity type within said first region at said surface and wherein said second metal does not form an alloy with said semiconductor.

3,863,335

PROCESS AND APPARATUS FOR BENDING THE ENDS OF INSULATING STRIPS IN GROOVES OR STATORS OF ELECTRICAL MACHINES

Hans Droll, 6 Bergen-Enkheim, Nordring, Germany

Filed Apr. 5, 1974, Ser. No. 458,432

Claims priority, application Germany, May 10, 1973, 2323590

Int. Cl. H02k *15/02*

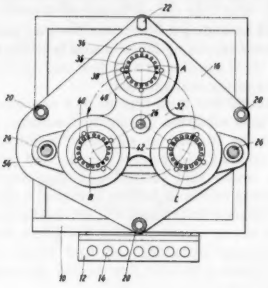
U.S. Cl. 29—596 **26 Claims**

1. In the manufacture of stators of electrical machines, a process for bending back the ends of thermoplastic insulating strips located in the stator grooves, comprising the steps of:

placing strips of thermoplastic, electrically insulating material into the stator grooves such that the end portions of the strip project axially of the stator beyond the end faces thereof,

heating the said projecting end portions,

bending the heated projecting end portions back against the end faces of the stator, and



holding the bent heated end portions against said stator end faces until they cool off.

3,863,336

METHOD OF MANUFACTURING FLAT-TYPE ROTORS

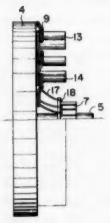
Kunihiro Noto, Katsuta, and Hiroaki Mizoguchi, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 19, 1973, Ser. No. 342,412

Claims priority, application Japan, Mar. 22, 1972, 47-28147

Int. Cl. H02r *43/00*

U.S. Cl. 29—597 **10 Claims**



1. Method of manufacturing a rotor for a flat-type motor comprising steps of:

winding a wire to make an armature coil in a flat cylindrical space, said flat cylindrical space being defined in part by one surface of a plate-shaped first mold on to which said wire is laid while being wound, said first mold having an interior configuration conforming to an outer configuration of a first portion of the rotor to be made,

providing a shaft extending along the longitudinal axis of the cylindrical space,

combining a second mold with said first mold to form a space between said first and second molds, said second mold having an interior configuration conforming to the outer configuration of a second portion of the rotor, and filling said space between said first and second molds with a resin material to provide an integrated unit having a predetermined mechanical strength, thereby forming said integrated unit which comprises said armature coil and said shaft.

3,863,337

POWDER METALLURGY METHOD FOR MAKING AN ELECTRIC CONTACT AND THE RESULTING CONTACT

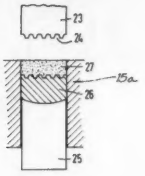
Horst Schreiner, and Bernard Rothkegel, both of Nurnberg, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 24, 1972, Ser. No. 283,408

Claims priority, application Germany, Sept. 1, 1971, 2143843

Int. Cl. H01r *9/00*

U.S. Cl. 29—630 C **4 Claims**



1. A powder metallurgy method for making a two-layer electric contact or the like, comprising:
   a. providing a first layer of refractory metal or metal compound powder;
   b. providing a second layer of low temperature melting metal powder;
   c. compacting said first and second layers together to form a coherent two-layer compact;
   d. providing a refractory surface having a plurality of depressions on the surface thereof;
   e. supporting said compact with its second layer on said refractory surface with said plurality of depressions therebeneath;
   f. heating said compact under non-oxidizing conditions to a temperature above the melting temperature of said low temperature melting metal to impregnate the pores of said first layer with the metal of said second layer; and
   g. the step of providing said second layer including proportioning said second layer such as to provide said compact with a volume of said low temperature melting metal in excess of the pore volume of said first layer to an extent causing the formation on the latter's bottom of a thin layer of said low temperature melting metal.

3,863,338

ELECTRIC SHAVER WITH CUTTERS MOUNTED IN END TO END ALIGNMENT

Roger Paul Wellinger, Neuchatel; Francis Andre Vauthier, Hauterive, and Alberto Botta, Lausanne, all of Switzerland, assignors to The Gillette Company, Boston, Mass.

Filed July 20, 1972, Ser. No. 273,480

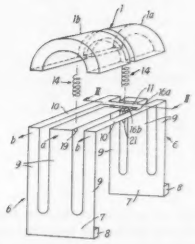
Claims priority, application Great Britain, Dec. 8, 1971, 56910/71

Int. Cl. B26b *19/04*

U.S. Cl. 30—43.92 **20 Claims**

12. An electric shaver comprising:
   at least two cutter sections movably mounted aligned with each other and in end-to-end relationship;
   drive means including a motor having a rotary output shaft; transmission means including a crank coupled to and driven by said motor shaft and a pair of crank throws driven by said crank and being coupled to said at least two cutter sections for driving said at least two cutter sections in end-to-end reciprocation, respectively in antiphase; and
   support means including mountings coupled to and resiliently supporting each cutter section, each mounting including a spring, the spring constants (K_1, K_2) of the mounting springs being selected in relation to the masses (M_1, M_2) of the respective cutter sections so that K_1/M_1 is substantially equal to K_2/M_2, so that the at least two cutter sections have substantially the same natural frequency of reciprocation;
   said motor being operable under power to simultaneously drive said movable cutter sections via said transmission means substantially continuously at a frequency of reciprocation substantially equal to said natural frequency.

17. An electric shaver comprising:
   two cutter sections movably mounted in alignment in end-to-end relationship;
   means for resiliently mounting the cutter sections for linear reciprocation in said aligned end-to-end relationship, said mounting means including resilient structures defining a natural rest position for each cutter section at substantially the centre of its path of linear reciprocation; and
   driving means including a motor having a rotary output shaft; and
   transmission means coupled to and driven by said motor shaft, and a pair of crank throws driven by said crank and being coupled to said cutter sections so as to substantially continuously and simultaneously reciprocate the respective cutter sections in antiphase such that the cutter sections move simultaneously towards and away from each other alternately and always pass substantially simultaneously through their said respective natural rest positions.



3,863,339

RETRACTABLE BLADE KNIFE

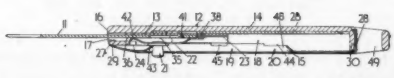
Albert Reaney, Rotherham, and Michael Taylor, Warwick, both of England, assignors to Stanley Tools Limited, Woodside, Sheffield, England

Filed May 23, 1973, Ser. No. 363,033

Claims priority, application Great Britain, May 26, 1972, 25061/72

Int. Cl. B26b *1/08*

U.S. Cl. 30—162 **13 Claims**



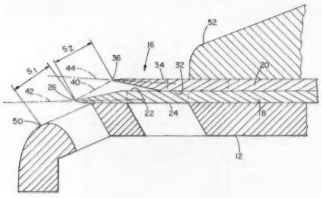
1. A retractable blade knife comprising a casing having a slot in one side thereof, a blade, a slidable blade carrier mounting the blade and engaging at least one edge thereof, an operating button projecting through said side slot and a leaf spring associated with the operating button for biasing the button into selective locking engagement with the casing and for removably holding the blade on the blade carrier, said casing comprises a body having a slot in one end through which the blade can be extended and retracted and a cover detachably attachable to the body to enclose the blade carrier and spring, wherein the cover has two curled opposite end portions which respectively hook over two corresponding end portions of the body, firstly one end portion of the cover being

hooked over one end portion of the body and then the cover being pivotable thereabout until the other end portion of the cover hooks over the other end portion of the body, whereby the cover can snap into place when attached to the body.

3,863,340
PLURAL EDGE SHAVING SYSTEM

Roger L. Perry, Lynnfield Center, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Sept. 8, 1972, Ser. No. 287,513
Int. Cl. B26b *21/54, 21/22*
U.S. Cl. 30—346.58 **9 Claims**



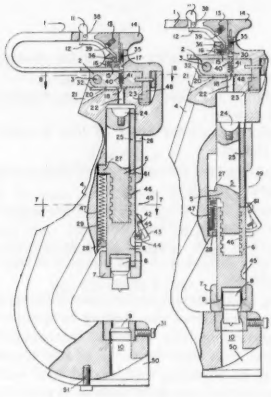
1. A plural edge structure for use in shaving, including a leading member and a following member, each of said members having the form of a plate bounded by first and second flat faces, and each said member having two intersecting facets that define a straight, sharpened cutting edge thereon parallel to said faces, each said cutting edge being offset outwardly from the center of the member at least about one-third the distance from the center of the member to its said first face so that it is positioned closer to the first than to the second of said faces, each of said facets being inclined with respect to the immediately adjacent face of the blade member and said two facets defining a bisector plane, said leading and following members being permanently affixed together with their respective second faces contiguous and with said cutting edges fixed in position parallel to each other in a plane inclined to said second faces in position to maintain a fixed distance perpendicular to said second faces of less than 0.02 inch between said cutting edge of said leading member and said cutting edge of said following member, a span between said cutting edge of said leading member and said cutting edge of said following member in the range of 0.03 inch to 0.08 inch and the angle between the bisector plane of the cutting edge of said following member and said plane containing both edges at a fixed value in the range of 20°–32°.

3,863,341
EXPLOSIVE ACTUATED PUNCH

James L. Ramer, Rt. 1, Box 155, Sullivan, Mo. 63080

Filed Aug. 27, 1973, Ser. No. 392,162
Int. Cl. B26f *1/02;* **B26d** *7/26*
U.S. Cl. 30—358 **4 Claims**

1. In an explosive activated punching tool the improvement comprising a main body, a longitudinal recess located in said main body, a cartridge chamber communicating with said recess, means for detonating a cartridge placed in said cartridge chamber, a piston slidably received in said recess, a ram slidably received in said recess below said piston and adjustably axially joined to said piston, said ram having a shoulder within said recess an axial recess in said piston, a longitudinal member slidably received in said axial recess and resting on said shoulder such that said member moves with said ram upon axial adjustment of said ram relative to said piston, and a single exhaust port in said main body for exhausting gases from said longitudinal recess, said exhaust port being disposed in the path of travel of said longitudinal member and cooperating with said longitudinal member and with said longitudinal recess whereby adjustment of the ram relative to the piston will vary the distance of travel of the longitudinal member before uncovering the exhause port so that in any position of relative adjustment for varying thicknesses of material to be punched when a cartridge in said cartridge chamber is detonated by said means for detonating a cartridge the explosion which results from the detonation forces the gases in said cartridge chamber and longitudinal recess to expand and force



said piston, said ram and said longitudinal member to move in said longitudinal recess until said longitudinal member uncovers the exhaust port and allows the gases to escape through said exhaust port thereby enabling the length of stroke of the punching tool to be varied according to the thickness of material to be punched.

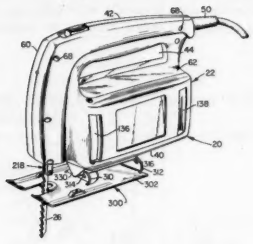
3,863,342
SABER SAW

David R. Griffies, Joppa, Md.; Russell O. Robinson, Plymouth, Ohio, and Robert W. Taylor, Jackson, Tenn., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sept. 17, 1971, Ser. No. 181,471
Int. Cl. B27b *19/08;* **B23d** *49/10*
U.S. Cl. 30—393 **6 Claims**

1. A hand-held, power-operated sabre saw comprising a housing, an integral handle for hand manipulation of said saw and a generally planar work-engaging surface adjustably at-

tached to said housing, a saw blade holder curved along a longitudinally extending axis of curvature mounted in said housing for reciprocation along said axis of curvature, a saw blade fixed to said holder for reciprocation therewith along said axis of curvature, and drive means in said housing for



reciprocating said holder along said axis of curvature to impart alternate cutting and return strokes to said blade, said axis of curvature being curved in a direction to provide said blade with a component of cutting stroke travel that is in the direction in which said blade is urged against a workpiece to cut said workpiece.

3,863,343

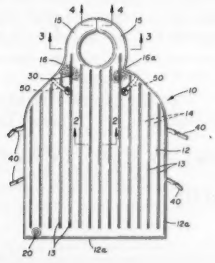
DENTAL PATIENT DRAPE

Oscar Malmin, 127 East Wayne Ave., Akron, Ohio 44301

Continuation-in-part of Ser. No. 183,519, Sept. 24, 1971, abandoned. This application Feb. 9, 1972, Ser. No. 224,865

Int. Cl. A22c *19/00*

U.S. Cl. 32—1 **10 Claims**



1. An inflatable protective patient drape, comprising;

A. a pair of impermeable membranes secured together at their peripheries to form an air-tight chamber;

B. means for introducing air into said chamber;

C. said membranes being secured to each other at transversely spaced intervals to divide said chamber into a plurality of longitudinally extending compartments

1. whereby said drape assumes a curved cross sectional configuration upon inflation and;

D. said membranes each having a pair of opposed, integral inflatable neck-engaging members at one end, with said neck-engaging members being arcuate in planar and cross-sectional configuration and substantially encircling the patient's neck

1. whereby said members will support the head and neck of said patient.

3,863,344

IMPLANTABLE DENTAL SUPPORT

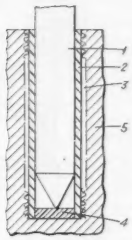
Jean Pillet, Paris, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Oct. 3, 1972, Ser. No. 294,546

Claims priority, application France, Oct. 6, 1971, 71.35968

Int. Cl. A61c *13/00*

U.S. Cl. 32—10 A **2 Claims**



1. In a dental endosseous root implant, having a tube able to receive an artificial tooth/supporting pin, said tube being provided with an external surface colonisable by surrounding tissues, the improvement comprising forming said implant as a tubular member closed at one end and formed of a resilient elastomer the external surface of which is covered by a textile sleeve.

3,863,345

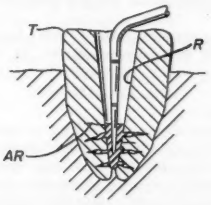
ENDODONTIC SEALING SYSTEM AND APPARATUS

Oscar Malmin, 127 East Wayne Ave., Akron, Ohio 44301

Division of Ser. No. 213,993, Dec. 30, 1971,. This application June 11, 1973, Ser. No. 368,514

Int. Cl. A61k *5/00*

U.S. Cl. 32—15 **5 Claims**



1. An endodontic system for chemically and mechanically sealing the main and auxiliary passages of a root canal system, comprising;

A. inserting an elongate instrument carrying a chemical sealing compound on one end thereof into said main passage;

B. activating said instrument and forcing the chemical sealing compound against the walls of said main passage and into said auxiliary passages and against the walls thereof whereby said compound chemically seals said passages;

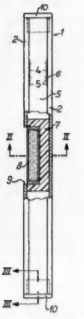
C. inserting at least one compressible sealing plug into said main passage;

D. condensing and compacting said plug and forcing the material of said plug into said auxiliary passages and against the walls of said main passage.

3,863,346
RIGID MEASURING ROD

Michel Quenot, Besancon, France, assignor to Stanley Mabo, Besancon, France

Filed Dec. 11, 1972, Ser. No. 314,028
Claims priority, application France, Dec. 9, 1971, 71.44151
Int. Cl. G01c 9/00
U.S. Cl. 33—88 3 Claims



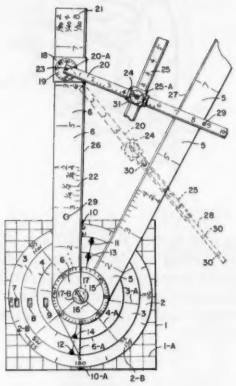
1. A measuring device comprising a rigid, linear, hollow rod; a bubble level mounted inside said hollow rod and in a viewable position; slideway means on said rod for interchangeably mounting at least one measuring tape on said rod for measuring therewith, said slideway comprising three parallel projections on said rod, all extending longitudinally of and reinforcing the rod, two of said projections being spaced apart and having surfaces defining two opposed, open ended, longitudinal grooves, and the third projection extending upwardly and beyond said surfaces; and a metallic, resilient measuring tape slidably received in the slideway and resiliently held in the grooves by said third projection.

3,863,347
NAVIGATION DEVICE

Philip Michael Banner, 28 Oxford Road, Massapequa, N.Y. 11758

Continuation-in-part of Ser. No. 27,535, April 13, 1970, Pat. No. 3,721,007. This application Nov. 21, 1972, Ser. No. 308,350
Int. Cl. B43l 7/06
U.S. Cl. 33—98 3 Claims

1. A navigation device comprising a base plate having a compass rose disposed about a central aperture, a plurality of concentrically mounted circular disc members rotatably mounted on said base plate on a common pivot axle extending through said central aperture, said disc members having diameters of decreasing size with the largest adjacent the base plate and the smallest at the top, each disc member having a compass rose upon its surface and means for viewing the compass rose on the disc immediately below it, said disc members and base plate cooperating to insert various navigation parameters such as compass deviation, compass reading, wind direction and current direction so that the various parameters are utilized to give a final reading; first and second protractor arms having circular base portions and radially extending arms concentrically pitotally mounted on said common pivot axle atop said plurality of disc members with the second of said protractor arms being uppermost, a longitudinal edge of each arm passing transversely through the vertical axis of the common axle, said arms having linear distance scales along the edges and adapted to measure and draw course lines on a chart, said first circular base portion having compass rose about the central axis and a reciprocal transparent index marker extending from the circumference thereof in line with the central axis and longitudinal edge to indicate reciprocals, said uppermost second base portion having a compass rose on the surface thereof and a safety right of way and vessel lighting dial inscribed thereon comprising three radial lines extending from the center axle to the circumference and spaced 120° apart; a first transparent slide member slidably mounted on said first protractor arm and having a compass rose thereon, a third protractor arm pivotally mounted on said first slide member and having an index marker to cooperate with said



compass rose, a second transparent slide member slidably mounted on said third protractor arm, said second slide member having a third transparent slide member pivotally mounted thereon and also having a compass rose thereon, a fourth protractor arm slidably received in said third slide member, index means connected to said fourth protractor arm to cooperate with said last mentioned compass rose; means on said first, second and third slide members for frictionally retaining the slide members in adjusted positions on their respective arms and means on said first and third arms for locking said third arm atop said first arm in a non-use position.

3,863,348
STAIR LAYOUT SCALE

Herbert H. Herbst, R.D. No. 1, Sunset Dr., Dallastown, Pa. 17313

Filed Mar. 7, 1973, Ser. No. 338,750
Int. Cl. G01b 3/04
U.S. Cl. 33—111 5 Claims

1. A scale system for laying out rise and tread dimensions on the beamlike support carriage for stairs and comprising an elongated member, a plurality of individual scales thereon respectively indicating the number of risers and treads and the widths of each for given individual total rises and runs for a desired stair installation, said scales each having duplex indicia including a limited range of choices in short increments of dimension respectively indicating by whole number the number of risers and by additional whole numbers and fractions the width of risers and by whole numbers indicating the number of treads and by additional whole numbers and fractions indicating the width of said treads, said duplex whole number and fraction indicia being placed upon said scales at progres-

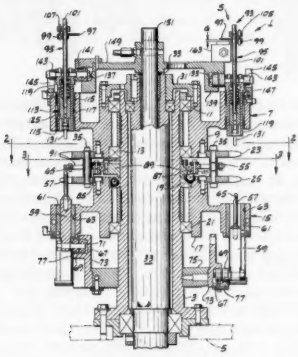
sive locations corresponding to actual given individual total rises and runs and comprising multiple transitions of the dimensional height of said risers and width of said treads relative to preferred numbers thereof to provide a limited selection possibility best suited for an individual stair installation, of said duplex indicia at said given dimensions having a second set of duplex and indicia indicating a different choice of whole numbers and fractions corresponding to actual given individual total rises and runs.

3,863,349

GAGING APPARATUS

David A. Wilson, Sheboygan, Wis., assignor to Perry Industries, Inc., Hicksville, N.Y.

Filed June 11, 1973, Ser. No. 369,082
Int. Cl. G01b *5/04*
U.S. Cl. 33—169 R **12 Claims**



1. Gaging apparatus comprising a proximity sensor mounted in fixed position at a gaging station, means for continuously conveying units one after another through said station past the sensor with a gap between the units and the sensor, said sensor being responsive to passage of each unit in proximity to the sensor to gage the gap between the unit and the sensor, and means for continuously conveying workpieces to be gaged one after another in a predetermined path through said station, wherein said units are gage members and said means for conveying the latter comprises an endless conveyor carrying said gage members and means for moving said gage member conveyor in an endless path at least part of which parallels the path of the workpiece conveyor through the gaging station with the gage members contacting the workpieces as they pass through the gaging station, said gaging members carrying means for passage in proximity to the sensor.

3,863,350

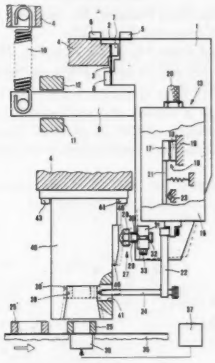
GAUGE PROVIDED WITH A RAPID AND AUTOMATIC ZERO-SETTING DEVICE

Sergio Solaroli, Bologna, Italy, assignor to Finike Italiana Marposs-Soc. In Accomandita Semplice de Mario Possati & C., Bentivoglio (Bologna), Italy

Filed Aug. 31, 1973, Ser. No. 393,477
Claims priority, application Italy, Sept. 15, 1972, 3534/72
Int. Cl. G01b *5/00*
U.S. Cl. 33—169 R **7 Claims**

1. A measuring apparatus for measuring dimensions of workpieces comprising:

a frame; connecting means; a support carried by the frame through said connecting means which permit movements of the support relative to the frame; a measuring head mounted on the support and comprising a measuring arm adapted to cooperate with the workpiece to be measured and movable in the head toward and away from the workpiece; detecting means mounted in the head for measuring the position of the arm in the head; said connecting means permitting movement of said support together with said measuring head toward and away from the workpiece; first mechanical reference means fixed on said support and second mechanical reference means fixed on said frame adapted to cooperate with said first mechanical reference means for displacing said support together



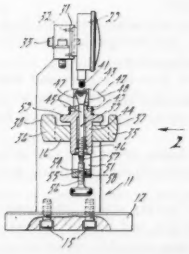
with said head in a defined position for the measurement of workpieces having a determined nominal dimension, this position corresponding to the head zerosetting; at least one of said first and second mechanical reference means being replaceable by similar reference means having a different determined dimension for achieving automatically the zero-setting of the measuring head, when measuring workpieces having a different determined nominal dimension.

3,863,351

GAUGE FOR CHECKING RADIUS AND SPHERICAL SURFACE

Stuart E. Kalen, Sterling Heights, Mich., assignor to Cogsdill Tool Products, Inc., Farmington, Mich.

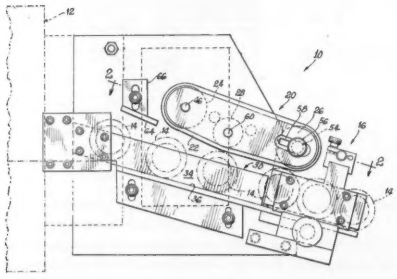
Filed Jan. 11, 1974, Ser. No. 432,497
Int. Cl. G01b *3/22, 5/20*
U.S. Cl. 33—169 R **5 Claims**



1. In a gauge, a base having a pair of uprights, a cradle, trunnions on said cradle pivotally secured on said uprights for rotatably supporting said cradle therebetween, an indicator supported on said uprights above said cradle, a support for a workpiece on said cradle which is adjustable axially toward and away from said indicator, means on said cradle for obtaining a reading on said indicator for a radius to be produced for

the surface of the workpiece, and means for moving a workpiece mounted on the support into engagement with the indicator until said reading is reproduced thereon and thereafter checking the sphericity of the workpiece surface relative to said reading.

3,863,352
GAGING APPARATUS WITH FLOW CONTROL MECHANISM
Edward Peonski, West Dundee, Ill., assignor to American Gage & Machine Company, Elgin, Ill.
Filed June 14, 1973, Ser. No. 369,898
Int. Cl. G01b *5/00*; **B65g** *19/02, 23/08*
U.S. Cl. 33—174 R **1 Claim**



1. Gaging apparatus for gaging a procession of workpieces, comprising a gaging station including gaging means for checking at least one dimension of each of the workpieces,

guide means including a downwardly inclined guide ramp for supporting and carrying the workpieces past said gaging station,

a first pulley disposed in a vertical plane above said guide ramp and rotatable about a horizontal axis,

motor means for rotating said pulley,

a carriage disposed above said guide ramp,

means supporting said carriage for swinging movement about the axis of said pulley in a generally vertical direction toward and away from said guide ramp,

said carriage being biased downwardly by gravity toward said guide ramp,

a second pulley rotatably mounted in a vertical plane on said carriage and swingable therewith toward and away from said guide ramp,

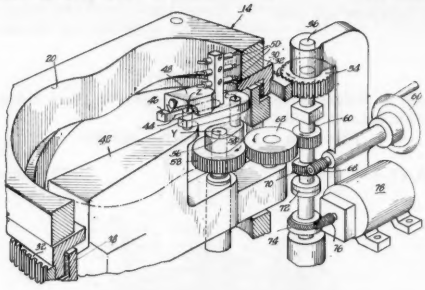
an endless drive belt strung around said first and second pulleys for positively moving the workpieces along said guide ramp at a controlled speed toward said gaging station,

said drive belt being swingable upwardly and downwardly with said carriage to accommodate workpieces of varying sizes,

said drive belt having upper and lower flights extending between said first and second pulleys,

and a third pulley rotatably mounted on said carriage between said first and second pulleys and deflecting said lower flight of said drive belt downwardly toward said guide ramp for causing the workpieces to be movable freely along said guide ramp into engagement with the lower flight of said drive belt opposite said third pulley whereupon the drive belt moves the workpieces along said guide ramp and past said gaging station at a controlled rate.

3,863,353
EPITROCHOIDAL SURFACE ENGAGING DEVICE
Oliver E. Saari, Niles, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Continuation-in-part of Ser. No. 257,835, May 30, 1972, abandoned. This application Sept. 22, 1972, Ser. No. 291,310
Int. Cl. G01b *5/20*
U.S. Cl. 33—174 R **21 Claims**

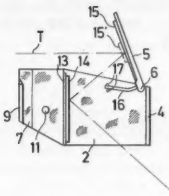


15. A device for engaging an epitrochoidal surface which defines the cavity in the cylinder block of a rotary type engine, including rotatable base means having a first fixed axis of rotation and having a surface disposed normal to said axis for supporting an engine cylinder block with the center of the epitrochoidal surface thereof coincident with the axis of rotation of said base means, means rotatable about a second fixed axis spaced laterally from and parallel to said first fixed axis, work engaging means for engaging the epitrochoidal surface of a supported cylinder block, means supporting said work engaging means, means pivotally coupling said supporting means with said means rotatable about said second fixed axis and having an axis spaced laterally from and parallel to said second fixed axis, the axis of said pivotal coupling means having a predetermined location with respect to said work engaging means, the distance between said second fixed axis and the axis of said pivotal coupling means being equal to the maximum degree of orbital eccentricity of the epitrochoidal surface of a supported cylinder block, guide means providing a third fixed axis and cooperatively disposed with respect to said work engaging supporting means, the distance between the axes of said second and third fixed axes having a predetermined relation to the distance between said first and second fixed axes, means cooperating with said fixed guide means and said supporting means for maintaining said third fixed axis and the points of contact of said work engaging means with the epitrochoidal surface of a supported engine block in a common vertical plane which is normal to a line tangent to said epitrochoidal surface at each point of contact, means for imparting rotation in a given direction to said base means at a given speed, and means for simultaneously imparting movement to said rotatable means in such a manner as to assure accurate positioning of said work engaging means with respect to said epitrochoidal surface.

3,863,354
MIRROR SIGHT FOR SMALL FIREARMS
Toivo Johannes Karppinen, 01900 Nurmijarvi, Finland
Filed Jan. 17, 1974, Ser. No. 434,272
Int. Cl. F41g *1/40*
U.S. Cl. 33—233 **6 Claims**

1. A mirror sight for small firearms, comprising a casing having two opposite side walls, a rear wall connecting said side walls, a cover plate turnably mounted on said side walls adjacent to said rear wall and extending along the upper edges of said side walls, and an open bottom, means in said side walls at the front ends thereof for mounting said casing on a small firearm behind the sights thereof with said cover plate in closed position situated at a level below said sights, a first mirror secured between said side walls adjacent to the front

ends thereof in a position substantially perpendicular to a straight line through said sights, a second mirror secured to the inside of said cover plate, and means for arresting said cover plate in an open position with respect to said first mirror



to reflect a lightbeam from a target through said sights from said second mirror to said first mirror and from said first mirror in a downward and backward direction, thus allowing aiming and firing of the firearm from full cover.

3,863,355

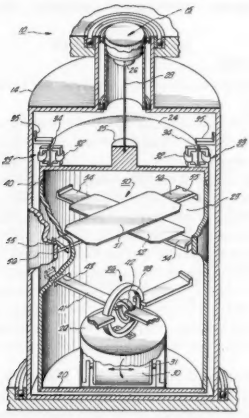
POWER TRANSFER ASSEMBLY

Darryl K. Bergstrom, Pacific Palisades, and David C. Clark, Los Angeles, both of Calif., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 220,962, Jan. 26, 1972. This application Mar. 24, 1972, Ser. No. 237,845. The portion of the term of this patent subsequent to June 18, 1991, has been disclaimed.

Int. Cl. G01c *19/04*

U.S. Cl. 33—324 **19 Claims**



1. In a pendulously supported gyroscope assembly having an exterior housing, a power supply exterior of said housing and means suspending said gyroscope assembly in said exterior housing for rotational movements about a vertical axis, the improvement comprising a power transfer assembly means for electrically interconnecting said power supply source with said gyroscope assembly including:

two pairs of flexible electrically conductive connection bands of an electrically conductive material lying in parallel planes that are transverse to said vertical axis, with each band comprising an arcuate circular segment with a portion of a full circle removed so that each arcuate band comprises less than a full circle and more than a semicircle with their centres of curvature lying on vertical axes, at least one of said respective bands being electrically connected to said power supply;

means for operatively connecting one end of each band of said pairs of bands to said gyroscope assembly; and

means for operatively connecting the other end of each band of said pairs of bands to said exterior housing, the bands being further characterized in that one pair of bands is inverted with respect to the other pair of bands to define opposed circular arcs whereby any forces created by flexure of said bands during operation of the gyroscope assembly are substantially counter balanced.

3,863,356

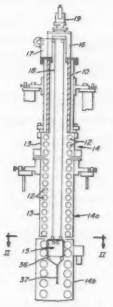
METHOD AND APPARATUS FOR CHECKING GUIDE-ROLL ALIGNMENT IN A CONTINUOUS-CASTING MACHINE

Thomas G. Bengel, Plum Borough; Joseph S. Giunia, Monroeville Borough, and Thomas E. Nicely, Westmoreland, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 18, 1972, Ser. No. 289,922

Int. Cl. G01c *15/00*

U.S. Cl. 33—286 **4 Claims**



1. In an apparatus for checking alignment of guide rolls of a continuous casting machine with respect to one another and with respect to a mold thereabove, said apparatus comprising:

a target adapted to be lowered through a mold into the roll pass;

a vertical transit;

a stand for positioning and centering said transit over the mold;

a reeling mechanism adapted to be mounted on the mold; and

a line suspending said target from said reeling mechanism for moving said target to various levels within the roll pass to be sighted on by said transit;

the improvement in which said target includes:

a pair of diagonally opposed angle irons having roll-contacting faces at right angles to one another;

a diagonally extending support;

means fixing said support with respect to one angle iron and permitting relative sliding movement between said support and the other angle iron;

spring means urging said angle irons apart to expand said target;

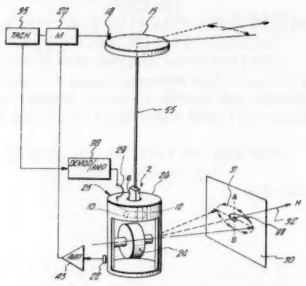
means for contracting said target against the action of said spring means; and

a grid pattern on said support centered with respect to the roll pass when the target is expanded into contact with the rolls.

3,863,357
POWER DRIVEN BAND CLAMP FOR PENDULOUS NORTH SEEKING GYROSCOPES

Ralph E. Knapp, Canoga Park, and David C. Clark, Los Angeles, both of Calif., assignors to Lear Siegler Inc., Santa Monica, Calif.

Filed June 23, 1972, Ser. No. 265,758
Int. Cl. G01c *19/38*
U.S. Cl. 33—324 18 Claims



1. A gyroscope comprising:

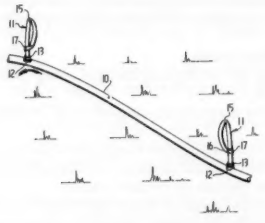
a pendulum unit having a gyro wheel assembly with a spin axis;

means for pendulously supporting said pendulum unit; and means for varying the position of the supporting means during gyro operation relative to said pendulum unit including the relative movement of the point of connection between the supporting means and said pendulum unit to provide a displacement along a path substantially parallel to the spin axis of the gyro wheel assembly for decreasing the pendulum period.

3,863,358
LEVELING DEVICE HAVING INTEGRAL SELF-LOCK FEATURE

Thomas K. Phares, Sr., Rt. 2, Box 231 D, Brandywine, Md. 20613

Filed Mar. 5, 1974, Ser. No. 448,390
Int. Cl. G01c *5/04*
U.S. Cl. 33—367 3 Claims



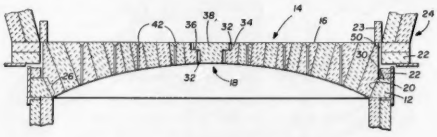
1. In a leveling system having a pair of flexible tubes, each of said pair of tubes having a free end and an end coupled to a hose at opposite ends of said hose comprising;

each of said pair of tubes having a cut portion extending in the form of a helix from its free end to a point remote therefrom for forming a locking position when each of said pair of tubes is folded upon itself, the said locking portion may be wound around the section of the tube upon which it is folded to hold said tube in said folded position.

3,863,359
REFRACTORY GAS DISTRIBUTOR FOR A FLUIDIZED SOLIDS REACTOR

John M. Grega, Pittsburgh, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 29, 1973, Ser. No. 410,653
Int. Cl. F26b *17/10*
U.S. Cl. 34—57 R 5 Claims

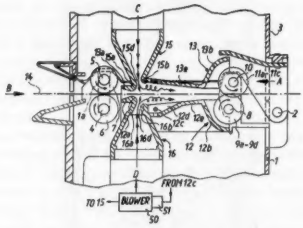


1. In a fluidized solids reactor having sidewalls lined with refractories, a perforated gas distributor or grid having an upper and lower surface and composed of a plurality of concentric courses of refractory brick, the outer periphery of the grid being supported on an oblique face of skewbrick embedded in the sidewalls of the reactor, air space located between the inner periphery of the sidewalls and outer periphery of the grid and an air space in the central portion of the grid formed from the innermost course of refractory brick to allow for expansion and contraction of the grid during service.

3,863,360
SHEET DRYING APPARATUS

Emile Stievenari, Hoboken/Antwerpen, Belgium, and Jurgen Muller, Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Munich, Germany

Filed Oct. 26, 1972, Ser. No. 300,992
Claims priority, application Germany, Oct. 28, 1971, 2153752
Int. Cl. F26b *13/04*
U.S. Cl. 34—155 15 Claims



1. Apparatus for drying sheet-like materials, comprising a hollow drying chamber having an inlet end and a discharge end, the cross-sectional area of said inlet end being substantially smaller than the cross-sectional area of said discharge end; first rotary sheet advancing means comprising a pair of rolls closely adjacent to said inlet end; second rotary sheet advancing means adjacent to said discharge end and defining with said first sheet advancing means an elongated path for travel of sheet-like material into, through and beyond said chamber; a source of gaseous drying fluid; and first and second nozzle means provided on said chamber adjacent to said inlet end at the opposite sides of said path and connected with said source, said nozzle means having orifices closely adjacent to said path and arranged to discharge streams of gaseous drying fluid against the respective sides of sheet-like material in said chamber whereby the drying fluid flows along the sheetlike material to leave said chamber by way of said discharge end, the cross-sectional area of said discharge end being large enough to allow for substantially unobstructed escape of gaseous fluid which is admitted into said chamber by

said nozzle means and the cross-sectional area of said chamber decreasing in a direction from said orifices toward said discharge end to a point near the discharge end and then increasing in cross-sectional area to the discharge end, said second sheet advancing means comprising first and second roll means located at opposite sides of said path, said first and second roll means defining a plurality of large passages so as to offer little resistance to escape of gaseous drying fluid by way of said discharge end.

3,863,361

METHOD AND APPARATUS FOR DRYING A GYPSUM BOARD OR THE LIKE

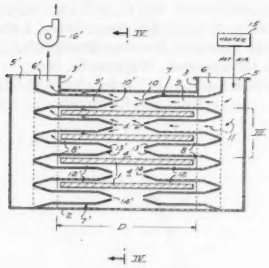
Klaus Gerhardt, Penzberg-Reindl, Germany, assignor to G. Siempelkamp & Co., Krefeld, Germany

Filed Mar. 29, 1974, Ser. No. 456,252

Claims priority, application Germany, Mar. 30, 1973, 2315981

Int. Cl. F26b *21/06*

U.S. Cl. 34—191 **8 Claims**



1. An apparatus for drying a flat workpiece, said apparatus comprising:

first and second spaced-apart upright side walls;

means for supporting said workpiece generally horizontally between said walls;

respective first and second conduits each extending inwardly from said first and second side walls past the edges of said workpiece and provided adjacent a central region of said workpiece with respective first and second nozzles directed generally horizontally toward each other;

respective first and second outlets in said first and second walls adjacent said conduits; and

means for passing a current of heated air over said workpiece alternately from said first nozzle to said second outlet and from said second nozzle to said first outlet.

3,863,362

BRIDGE PLAYING DEVICES

Henri Marie Leon Borianne, 10 Avenue de Wagram, 75008 Paris, France

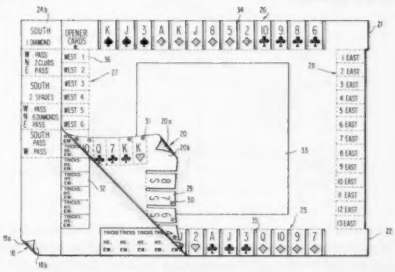
Filed Nov. 14, 1973, Ser. No. 415,756

Claims priority, application France, May 8, 1973, 73.16444; Nov. 17, 1972, 72.40900

Int. Cl. A63f *1/10*

U.S. Cl. 35—8 B **11 Claims**

1. A device for enabling an individual to play bridge deals on his own, comprising a four-sided support representing a bridge table and bearing at each of its four sides thirteen cards of a hand corresponding to a deal in question; said cards being in form of respective detachable slips, those of said slips of two opposite sides corresponding to hand of declarer and his partner being provided with cards on the obverse visible face of said support classified according to color, according to order and value in each color and provided on the reverse hidden face thereof with an order number corresponding to number of trick in which respective ones of said slips in question have to be played; those of said slips of the two other sides corresponding to opponents' hands having their card face on said hidden face of said support, a respective number of a trick on said visible face thereof, and being arranged according to the regularly increasing or decreasing order of these numbers,



and wherein said support is defined by a first flap of a diptych-like tablet, a second flap of which totally covers its hidden face, said second flap bearing on its outer visible face printed reproduction of hand of declarer and on one of its sides overlapping said support detachable slips bearing on their hidden face successive bids recommended for deal in question.

3,863,363

PLANETARIUM

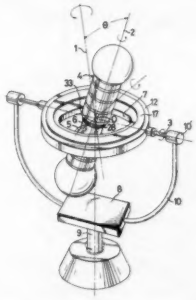
Toru Miyajima, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 172,798, Aug. 18, 1971, abandoned. This application Apr. 19, 1973, Ser. No. 352,835

Claims priority, application Japan, Aug. 25, 1970, 45-74695

Int. Cl. G09b *27/00*

U.S. Cl. 35—42.5 **8 Claims**

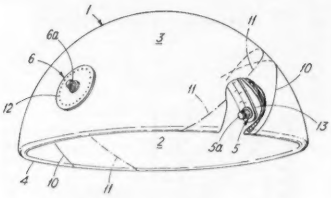


1. A planetarium system having an adjustable angle between the diurnal motion and precessional motion axes comprising a planetarium projector unit, a ring first mount supporting said projector unit for precessional rotation about the axis thereof, a second mount, a third mount supporting said second mount for diurnal rotation about the axis thereof, a fourth mount supporting said third mount for rocking about a transverse axis of said third mount for adjusting the latitude orientation of said projector system, a base supporting said fourth mount and means including diametrically opposing rods radially extending between said first and second mounts for varying the angle between said precessional and diurnal axes.

3,863,364
EDUCATIONAL/NAVIGATIONAL DEVICE

Bruce King, Forest Row, Sussex, England, assignor to King Scientific Limited, London, England

Filed Sept. 5, 1973, Ser. No. 394,512
Claims priority, application Great Britain, July 24, 1973, 35252/73
Int. Cl. G09b 27/04
U.S. Cl. 35—43 9 Claims

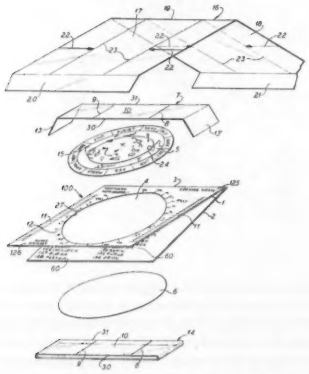


1. A device for displaying the positions of at least some of the celestial bodies of the celestial sphere, comprising a flexible envelope collapsed and evacuated and sealed in a hemispherical configuration presenting an inwardly concave wall and an outwardly convex wall joined by a horizon rim, a low-friction coating on the interior of the envelope and a rigidifying horizon ring member enclosed by the envelope and having a diameter substantially equal to the diameter of said flexible envelope, said horizon ring member having a rounded rim at the horizon and said envelope bearing the entire celestial sphere distributed over said inwardly concave and outwardly convex walls, whereby manipulation of the envelope enables a different, truly hemispherical portin of the celestial sphere to be presented on said inwardly concave surface of the envelope.

3,863,365
STAR FINDER

Henry Moliard, 942 Avenida Central, Guadalupe, Costa Rica

Filed Jan. 21, 1974, Ser. No. 434,818
Claims priority, application France, Jan. 25, 1973, 73.02617
Int. Cl. G09b 27/04
U.S. Cl. 35—44 21 Claims

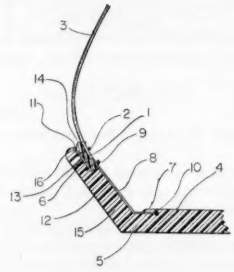


1. A device for quickly and easily pictorially representing stars as they would appear from earth at any selected latitude and at any selected time and date which comprises a flat base providing two panels, each panel having scales of latitude along the sides thereof and a central circular twenty-four hour scale, a circular disk for each panel surrounded by said circular scale and rotatable relative to said panel, each disk having circumferentially arranged indicia designating the months of the year and the days of each month arranged so that a selected date may be aligned with a selected hour on the surrounding hour scale, one disk having indicia surrounded by the circumferential indicia representing the principal star constellations of the Northern hemisphere, the other disk having indicia surrounded by the circumferential indicia representing principal star constellations of the Southern hemisphere, slides overlying the panels and their disks shiftable along the length of the longitudinal scale on the panel and having a window overlying and isolating a portion of the disk on the panel, and said scale of latitude, said scale of hours, said circumferential scale of dates and said constellation indicia being correlated so that alignment of the slide with a selected latitude on the scale of latitudes and rotation of the disk to align a selected date with a selected hour will expose in the window the principal star constellations that would appear to an observer at the selected latitude and at the selected date and time.

3,863,366
FOOTWEAR WITH MOLDED SOLE

Horace Auberry, Waynesville; Sven Oberg, Lake Junaluska, and Kenneth Smathers, Waynesville, all of N.C., assignors to Ro-Search Incorporated, Waynesville, N.C.

Filed Jan. 23, 1974, Ser. No. 435,651
Int. Cl. A43c 13/08
U.S. Cl. 36—14 8 Claims



1. Footwear comprising an upper, a tread sole, said tread sole having a portion thereof extending upwardly to form a peripheral side edge, said sole and side edge being formed of elastomeric material, a strip of material secured to said upper above the insole level and said side edge being molded directly to said strip.

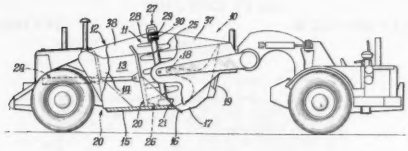
3,863,367
AUGER SCRAPER WITH RECESSED EJECTOR

James E. Gee, Washington, and Robert N. Stedman, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 19, 1973, Ser. No. 416,954
Int. Cl. E02f 3/06
U.S. Cl. 37—8 6 Claims

1. A self-loading auger scraper comprising
a bowl having a pair of laterally spaced and vertically disposed sidewalls, a generally horizontally disposed floor connected between said sidewalls and a cutting edge extending transversely between said sidewalls and secured to a forward end of said floor,
a generally upright ejector, extending between said sidewalls, normally positioned at a rearward end of said bowl, actuating means for selectively moving said ejector from the rearward end towards an open, forward end of said bowl, adjacent to said cutting edge,

a generally upright auger rotatably mounted in said bowl, and disposed rearwardly of said cutting edge,



means for rotating said auger, and

means forming a recess in said ejector, generally conforming to the shape of said auger, for permitting said ejector to move adjacent to said cutting edge upon actuation of said ejector towards the forward end of said bowl.

3,863,368

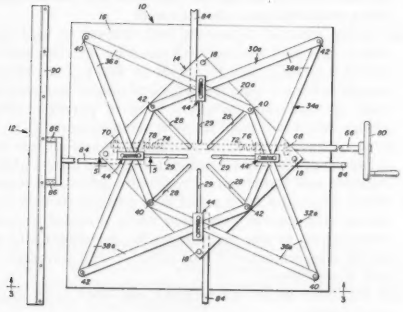
EXPANDER, DEVICE FOR STRETCHING A FABRIC SHEET

Michael Vasilantone, 147 E. First Ave., Roselle, N.J.

Filed Apr. 24, 1972, Ser. No. 246,697

Int. Cl. D06c *3/08*

U.S. Cl. 38—102.5 **6 Claims**



1. An expander device for stretching fabrics comprising a framework, a linkage system on said framework comprising a pair of parallelogram linkage sections each having major and minor axes, each parallelogram linkage section comprising bars connected to each other for relative pivotal movement, said sections being vertically stacked and angularly disposed relative to each other such that the major axis of one of said sections extends generally transversely to the major axis of the other, said stacked sections defining points of over-lap, said framework including a plurality of radially extending guide means slidably mounted therein, the bars of overlapped linkage sections engaging with said guide means at said points of overlap, fabric gripper elements mounted for movement with said guide means and extending outwardly therefrom, drive means operably connected to a single opposed pair of guide means for expanding and contracting said linkage system, said guide means providing for controlled uniform and simultaneous movement of said gripper elements toward and away from the center of said framework.

3,863,369

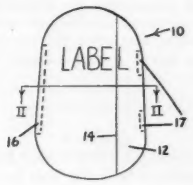
LABEL

Lewis K. Kinne, Hopkins, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Aug. 14, 1972, Ser. No. 280,313

Int. Cl. A44c *3/00*

U.S. Cl. 40—2 R **7 Claims**



1. A multi-page label comprising an inner page, at least one outer page and a hinge connecting said inner and outer pages, at least one of said inner and outer pages having a pleat formed transversely to the plane thereof and being of such shallow depth so as not to materially affect the overall thickness of said page, said pleat being positioned intermediate of the edges of said page to thereby provide said page with extensible means.

3,863,370

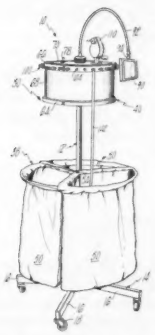
FILM TRIM BIN

Norval F. Smith, Pomfret Center, Conn., assignor to The Communicators, Inc., Pomfret Center, Conn.

Filed June 7, 1973, Ser. No. 367,977

Int. Cl. G09f *13/10*

U.S. Cl. 40—106.1 **11 Claims**



1. A film trim bin for mounting film trims thereon comprising a rotary film bin and a rotary film bin support for rotatably mounting the rotary film bin about a generally upright axis, the rotary film bin comprising annular hanger means for hanging a plurality of film trims angularly spaced about the axis of the rotary film bin and with the film trims depending therefrom and whereby the rotary film bin may be rotated for mounting and removing the film trims in a desired sequence, the rotary film bin further comprising annular container means below the hanger means and means connecting the container means to the hanger means for rotation therewith for containing the lower ends of the depending film trims and for rotating them with the annular hanger means to accommodate the mounting and removal of the film trims.

8. A film trim bin for mounting film trims thereon comprising a rotary film bin, a rotary film bin support for rotatably mounting the rotary film bin for rotation about a generally

upright axis, the rotary film bin comprising generally annular illuminating window means, annular film trim hanger means above the generally annular illuminating window means for hanging a plurality of film trims angularly spaced about the rotary film bin axis and in front of the generally annular illuminating window means to be viewed with the window means providing an illuminated background, the rotary film bin further comprising annular container means below the hanger means and means connecting the container means to the hanger means for rotation therewith for containing the lower ends of the depending film trims and for rotating them with the annular hanger means to accommodate the mounting and removal of the film trims.

3,863,371
CHALLENGE LADDER CARD DISPLAY

William J. Shertenlieb, 600 N. Fig Tree Ln., Plantation, Fla. 33313

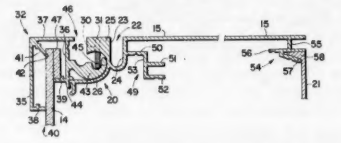
Filed Oct. 18, 1973, Ser. No. 407,425
Int. Cl. G09f *1/10*
U.S. Cl. 40—124.2 **5 Claims**

1. A card display assembly kit for challenge ladder competition comprising the combination of a rack having a plurality of vertically spaced, upwardly-facing, consecutively numbered pockets of a predetermined horizontal width, and a plurality of reversible cards of slightly smaller horizontal width than said pockets in the rack for slidable reception in said pockets individually facing forward or in pairs with one card of the pair reversed front to back, each of said cards having a tab at one side extending across the top of the card substantially less than the full width of the card and substantially less than the width of the pocket in the rack in which that card is received and projecting above the top edge of said pocket when said card is fully inserted therein, and similar indicia on both the front and the back faces of the tab on each card for naming the contestant whose card that is, whereby, when any card is removed from its pocket and is reversed front to back and fully inserted into a pocket containing another fully inserted, forwardly facing card, the top tabs on the two cards in said last-mentioned pocket are located side by side above the top edge of said pocket and simultaneously display visibly without obstruction by one another the name indicia for the two contestants whose cards those are.

3,863,372
SIGN BOX WITH CLOSURE

Johann Stilling, 1141 Royal York Rd., Apt. A1001, Islington, Ontario, Canada (M9A 4A9)

Continuation-in-part of Ser. No. 285,206, Aug. 31, 1972, abandoned. This application July 9, 1973, Ser. No. 377,236
Int. Cl. G09f *13/04*
U.S. Cl. 40—132 R **24 Claims**



1. A sign box for the construction of an illuminated sign having illumination elements said box comprising;

a main frame having a top member, side members and a bottom member for containing the illumination elements and having at least one open side defined by the side edges of said members, said top member, said side members and said bottom member all being formed of extruded metallic material of identical cross-section;

a front panel removably attachable to said main frame for holding a translucent sign element in registration with said open side, said front panel having a top member, side members and a bottom member for supporting said translucent element, said top member, side members and bottom member all being made of extruded metallic material of identical cross-section;

a curved concave wall formation formed on said main frame around all four sides thereof, said concave wall formation being extruded integrally therewith

and being directed outwardly with respect to said main frame; said wall formation terminating in a free end directed forwardly, said free ends on said top and bottom members lying in parallel horizontal planes, and said free ends on said side members lying in parallel vertical planes, when said main frame is standing upright;

a curved convex formation extending around all four said members of said front panel and shaped to mate with said concave wall formation on respective sides of said main frame when said front panel is in position on said main frame, said convex formation being directed inwardly with respect to said main frame for movement into and out of engagement with said concave wall formation on said main frame;

and releasable means for securing said front panel to said main frame.

3,863,373
LABELED SIDE-SEAMED CAN BODY

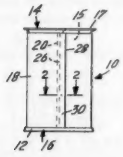
Ralph William Kaercher, Barrington, Ill., and Stanley Wiswell Pierce, deceased, late of Lombard, Ill. (by Martha Murphy Pierce, executrix), assignors to American Can Company, Greenwich, Conn.

Filed June 26, 1973, Ser. No. 373,746
Int. Cl. G09f *3/10*
U.S. Cl. 40—306 **27 Claims**

1. A cylindrical side-seamed metal can body having a wrinkle-free water-resistant film label bonded to substantially the entire circumference of the can body wall, which comprises: a cylindrical side-seamed metal can body, the side seam area of the can body wall having an exterior surface which includes a side seam juncture, and

a non-stretchable, wrinkle-free, water-resistant film label bonded to substantially the entire circumference of the can body wall by a quick-tack hot-melt adhesive, the label being comprised of a base layer and an adhesive layer, the base layer being selected from the group consisting of

polyethylene terephthalate, and a composite of (1) a vinylidene chloride polymer-coated cellophane and (2) a water-resistant overcoat selected from the group consisting of polyethylene, polypropylene and a rapid-curing oleoresinous material, the adhesive being selected from the group consisting of a wax material and an ethylenic



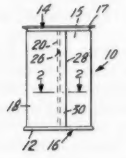
acidic polymer, the label having a leading edge and a trailing edge, the leading edge being positioned parallel to the central axis of the can body within the side seam area and the trailing marginal edge portion being lapped over and adhered to the underlying marginal edge portion of the leading edge so that the overlap is within the side seam area.

3,863,374

LABELED SIDE-SEAMED CAN BODY

Lowell Elmo Ray, Elgin, Ill., assignor to American Can Company, Greenwich, Conn.

Filed June 26, 1973, Ser. No. 373,768
Int. Cl. G09f *3/10*
U.S. Cl. 40—306 **27 Claims**



1. A cylindrical side-seamed metal can body having a non-stretchable, wrinkle-free, water-resistant paper based film label bonded to substantially the entire circumference of the can body wall, which comprises:

a cylindrical side-seamed metal can body, the side seam area of the can body wall having an exterior surface which includes a side seam juncture, and

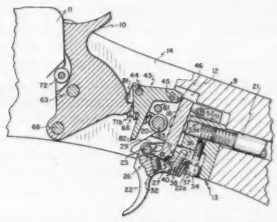
a non-stretchable, wrinkle-free, water-resistant paper-based film label bonded to substantially the entire circumference of the can body wall by a quick-tack hot-melt adhesive, the label being comprised of a base layer and an adhesive layer, the base layer being an opaque composite whose first layer is selected from the group consisting of a white water-resistant paper and paper-backed foil, and whose second layer is a water-resistant overcoat selected from the group consisting of polyethylene having a density above about .940 grams per cc., polypropylene and a rapid-curing oleoresinous material, the adhesive being selected from the group consisting of a wax material and an ethylenic acidic polymer, the label having a leading edge and a trailing edge, the leading edge being positioned parallel to the central axis of the can body within the side seam area and the trailing marginal edge portion being lapped over and adhered to the underlying marginal edge portion of the leading edge so that the overlap is within the side seam area.

3,863,375

TRIGGER SYSTEM

Bruce W. Browning, Ogden, Utah, assignor to Browning Arms Company, Morgan, Utah

Filed July 13, 1973, Ser. No. 378,952
Int. Cl. F41c *19/00*
U.S. Cl. 42—69 R **9 Claims**



1. A trigger system for a firearm comprising:

a trigger housing;

a hammer, pivotally mounted to said housing and carrying catch means;

a sear, carrying a first lock means for holding the hammer in a half cock position and a second lock means for holding the hammer in a fully cocked position, pivotally mounted to said housing to register respective said lock means with said catch means when said hammer is pivoted to half cock and full cock positions, respectively; a trigger pivotally mounted to said housing;

means operably connecting said trigger to said sear to release the hammer from said fully cocked position upon pulling the trigger;

nonadjustable bias means mounted to provide a selected minimum bias of said sear against said hammer; and

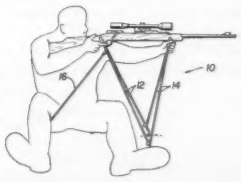
second, adjustable bias means mounted for adjustment to additionally bias said sear against said hammer.

3,863,376

PORTABLE, FOLDABLE RIFLE OR GUN SUPPORT

Reno Dalmaso, R.D. 1, Pone Ln., Franklin, Pa. 16323

Filed June 18, 1973, Ser. No. 370,844
Int. Cl. F41c *21/00*
U.S. Cl. 42—94 **4 Claims**

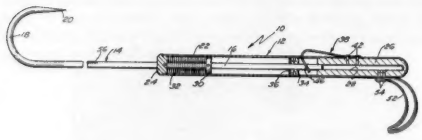


1. A gun support comprising, in combination, a pair of front legs and a pair of intermediate legs, each pair being laterally pivotable toward and away from each other at a point adjacent their upper ends; the lower ends of said intermediate legs being ground engaging, and the lower ends of said front legs being pivoted to said intermediate legs at a point spaced above the ground for movement forwardly away from or rearwardly toward said intermediate legs; the lower ends of said front legs bearing against said intermediate legs when in forward most position to limit separation of the two pairs of legs; and a fifth leg pivoted to the upper ends of said intermediate legs and extending rearwardly thereof to vary the angle of a gun resting on the upper ends of said front and intermediate legs.

3,863,377
FISHING GAFF

Clifford R. Leonard, 27 Church St., East Providence, R.I. 02914

Filed Sept. 17, 1973, Ser. No. 398,238
Int. Cl. A01k 81/00
U.S. Cl. 43—6 8 Claims

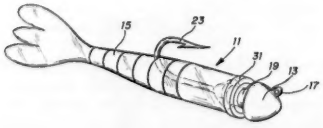


1. A fishing gaff, comprising a hollow handle, a gaff rod having an elongated shaft portion extending into said hollow handle for axial movement the rein and a hook portion joined to said shaft portion and located in spaced relation relative to said handle, said gaff rod being axially movable relative to said handle from an inner inactive position to an outer cocked position, wherein said hook portion is moved outwardly relative to said handle, spring means located in said handle and responsive to outer movement of the gaff rod for biasing the gaff rod in the outer cocked position, and a trigger mounted on said handle and engaging the shaft portion of said gaff rod for releasing the gaff rod from the cocked position, wherein said gaff rod is rapidly urged inwardly in a retracting movement by said spring means for penetrating the body of a fish when the fish is to be boated after the landing thereof, said trigger having an inwardly extending forward portion in which an opening is formed, the shaft portion of said gaff rod extending through said opening and being restrained therein when the gaff rod is biased to the outer cocked position thereof.

3,863,378
FISHING LURE

Ike J. Walker, 916 S. Rusk St., Gainesville, Tex. 76240

Filed Aug. 14, 1973, Ser. No. 388,192
Int. Cl. A01k 85/00
U.S. Cl. 43—42.28 20 Claims



1. A fishing lure comprising:

an enlarged lure body having a rearwardly extending trailer engaging post with an enlarged head portion at the rear end thereof, a fixed hook extending from the extremity of said post;

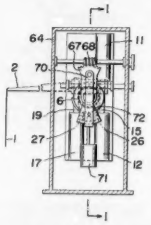
a solid trailer of soft pliable material, a portion of one end of said trailer is threaded onto said hook and over said post;

a resilient ring concentrically overlying a portion of said one end of said trailer, said ring being of less pliable material than said trailer and having an inside diameter relative to the outside diameter of the post such that soft pliable material of said one end of said trailer is compressed between the ring and the body to effect a gripping action on the post and being elastically deformable to permit said ring to be forced over said head for holding said trailer in engagement with said lure body.

3,863,379
APPARATUS FOR AUTOMATIC ANGLING ON FISHING VESSEL

Tadashi Kobayashi, 1560-2 Tenma, Fuji, Japan

Filed July 2, 1973, Ser. No. 375,702
Int. Cl. A01k 79/00
U.S. Cl. 43—6.5 4 Claims



1. A fish angling arrangement, comprising in combination:

a. a revolving shaft (5) coupled to a fishing rod (2) for holding a line (1), first mechanical means (10, 16) coupled to said revolving shaft for rotating said shaft so as to raise and lower said rod (2), a ring (6) mounted coaxially with said shaft, a first cam (7) for lowering said rod (2);

b. a second cam (8), an acceleration sensor (25) actuated by said second cam (8) as a certain angle is reached;

c. a hydraulic control valve (21) with a first fluidic terminal (59) coupled to said first mechanical means for controlling the mechanical means;

d. hydraulic fluid flow means actuated by said second cam (8) including a second terminal (61), an acceleration control valve (23) actuated by said terminal, and second mechanical means responsive to said second control valve (23) accelerating the turning of said revolving shaft;

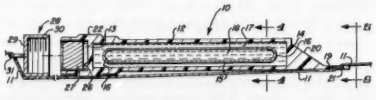
e. a selector valve (3) connected to said rod (2) responsive to the weight of a fish pulling on said line (1); and,

f. fluidic logic OR-NOR and flip-flop gating circuits (35, 39, 40) responsive to said selector valve (3) connected to said fluidic terminal (59), for controlling said first mechanical means, whereby the weight of a fish on said line (1) will enable said selector valve (3) causing air to flow through said logic circuits to said fluidic terminal, in turn, actuating said mechanical means turning the revolving means to lift thereon rod (2).

3,863,380
ILLUMINATED FISHING LURE WITH LINE ATTACHMENT

John M. Purlia, 8908 Shelbyville Rd., Apt. 6, Louisville, Ky. 40222

Continuation-in-part of Ser. No. 365,595, May 31, 1973,. This application June 24, 1974, Ser. No. 482,668
Int. Cl. A01k 85/00
U.S. Cl. 43—17.6 6 Claims

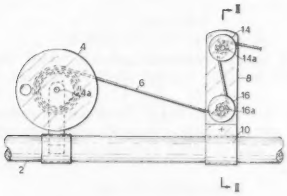


1. In an illuminated fishing lure,

a. a cartridge comprising an outer flexible tube having end walls, an inner rigid frangible tube within and spaced from said outer tube, a chemiluminescent material in the space between said tubes and another chemiluminescent material in said inner tube, said chemiluminescent materials being complemental so that when they intermix and react, they generate a chemical light;

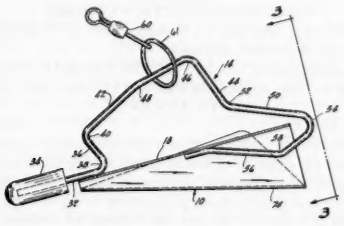
b. a tab formed as a longitudinal continuation of said outer tube and extending beyond one of said end walls, said tab being formed with an aperture for receiving a fishing line;
c. a sleeve integral with said outer tube adjacent to the other of said end walls and having an end portion projecting longitudinally beyong said last mentioned end wall and defining a socket;
d. a weight removably received in said socket;
e. a cap secured to the projecting portion of said sleeve and having a top wall, and
f. an eyelet mounted on said top wall and receiving said fishing line.

3,863,381
CORD WINDING DEVICE PARTICULARLY FOR FISHING RODS
Shaul P. Ladany, 5700 Arlington Ave., Apt. 165, Bronx, N.Y. 10471
Filed Mar. 7, 1974, Ser. No. 448,940
Int. Cl. A01k *87/04*
U.S. Cl. 43—25 **9 Claims**



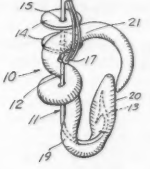
1. A cord winding device, particularly for fishing rods, including a reel for winding and unwinding the cord, and a supporting member rotatably supporting the reel, the cord winding device comprising bracket means attached to the supporting member at a location spaced longitudinally thereof, and a pair of rollers rotatably mounted on said bracket means and spaced from each other transversely of the supporting member, the axes of rotation of the rollers being parallel to each other and to the axis of rotation of the reel, said rollers being formed with grooves for receiving the cord around one and then around the other in an S-formation, thereby tensioning the cord as it is wound and unwound from the reel, the cord being easily unseatable from the grooves by the user to enable its quick unreeling from the reel.

3,863,382
DIVING PLANE FOR FISHING LURES
Dean H. Heili, 502 Waldo Blvd., Manitowoc, Wis. 54220
Filed Oct. 23, 1973, Ser. No. 408,820
Int. Cl. A01k *95/00*
U.S. Cl. 43—43.13 **26 Claims**



1. A diving plane suitable for connection to a trolling line for drawing the line to a desired water depth upon relative movement of the plane and water by assuming a downwardly canted diving position, said diving plane comprising:
a rigid vane having a pointed end which is forward when said plane is in the canted diving position, a flared rear end and a pair of channels diverging from said forward end towards said rear end, said channels being formed from a medial portion having a pair of arcuately disposed, generally triangularly shaped sides depending from a common ridge, and an upright arcuately disposed generally triangular shaped flange joined to each side of said medial portion; and
an elongated, rod like bail fastened to said vane for slidably receiving the trolling line, said bail having a central portion located above said vane and sloping downward toward said forward pointed end, said rod being bent to form a first knee at the rear end of said central portion for receiving the trolling line where the diving plane is in the downwardly canted diving position and a second knee at the forward end of said central portion positioned rearwardly of said forward end of said vane for receiving said trolling line when said diving plane is in an upwardly canted surfacing position.

3,863,383
BAIT SAVER
Gregory Lore, 2775 21st St., Sacramento, Calif. 95818
Filed Jan. 29, 1974, Ser. No. 437,642
Int. Cl. A01k *83/06*
U.S. Cl. 43—44.8 **6 Claims**



1. In a bait saver, a fish hook includes a shank having an eye on one end thereof, a tip on the other end of the shank, a pair of spaced apart washers moveably mounted on said shank and having centrally disposed apertures therein for the projection therethrough of the fish hook shank, a leader extending through said eye and connected to said shank, said leader extending over and engaging the outer periphery of said washers.

3,863,384
INSECT TRAP
John Weatherston, and James H. Moffatt, both of Sault Ste. Marie, Ontario, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada
Filed Feb. 1, 1974, Ser. No. 438,731
Claims priority, application Canada, Mar. 29, 1973, 167492
Int. Cl. A01m *1/14*
U.S. Cl. 43—114 **3 Claims**

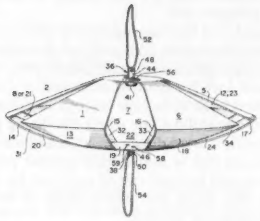
1. An insect trap comprising:
a. a plurality of upper panels of flexible sheet material joined at their inner ends and extending radially outwardly with insect entrances slots between them, with the upper panels spaced circumferentially around the join,
b. a plurality of lower panels of flexible sheet material joined at their inner ends and circumferentially spaced around the join and extending radially outwardly, with insect entrance slots between them, to positions at which

each lower panel is joined adjacent an outer end to an overlying upper panel,

c. an insect trapping sticky coating on opposed, facing surfaces of the upper and lower panels,

d. an insect luring odour emitting substance between the upper and lower panels,

e. means for suspending the trap with the upper panels uppermost,



f. means for suspending the trap with the lower panels uppermost, and whereby

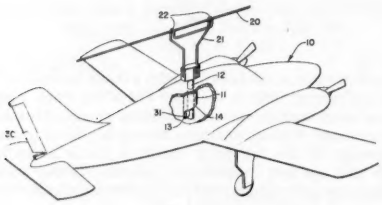
g. the trap may be stored in a flat condition with the facing surface of the upper and lower panel contacting one another, and the upper and lower panels may be pulled to space their facing surfaces for use.

3,863,385

CAM DEVICE FOR ALIGNING AND TURNING MOVING TOY

Joseph T. Becker, 21 W. 674 Glen Valley Dr., Glen Ellyn, Ill. 60137

Filed Aug. 27, 1973, Ser. No. 391,684
Int. Cl. A63h *27/04*
U.S. Cl. 46—1 H **7 Claims**



1. In a toy including a vehicle supportable on an inclined elongated support surface, so as to be movable along the longitudinal axis of such support surface, means for changing the direction in which the vehicle is facing with reference to the support surface, comprising:

a cam surface;

a cam follower adapted to slidably engage the cam surface with the weight of the vehicle supported by contact between the cam surface and the cam follower, and with either the cam surface or the cam follower being supported by the inclined support surface; such that the weight of the supported vehicle induces a rotation of the cam follower relative to the cam surface, thereby rotating the supported vehicle;

means for heading the vehicle in one direction and for releasing it for pivoting through a desired angle; and

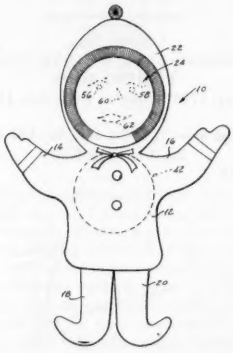
means for stopping the turn after the desired angle is reached.

3,863,386

READILY ERASABLE DOLL FACE ASSEMBLY

Benjamin Kinberg, New York, N.Y., assignor to Horsman Dolls Inc., Columbia, S.C.

Filed Dec. 14, 1973, Ser. No. 424,657
Int. Cl. A63h *3/36*
U.S. Cl. 46—135 R **8 Claims**



1. A doll including in combination, a torso, a head carried by said torso, a face opening in said head, a face assembly comprising an opaque backing plate, a translucent flexible sheet incorporating an iridescent dye, means mounting said flexible sheet and said backing plate in cooperative relationship with an inner surface of said sheet in closely spaced relationship to the surface of said backing plate, said face assembly being positioned in said face opening, the inner surface of said flexible sheet adapted releasably to adhere to the surface of said backing plate in response to pressure applied to the outer surface thereof to cause said dye to glow at points at which said pressure is applied to present a display corresponding to locations at which said pressure is applied, a bellows in said torso adapted to be compressed in response to squeezing of said torso, and means providing communication between the interior of said bellows and the spaces between said sheet and said backing plate to erase a display in response to said squeezing.

3,863,387

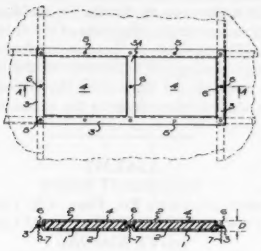
GROUND PROTECTION COVERS

Joseph Webster, and Doreen Webster, both of 39 Jenkin Ln., Horburg, Wakefield, England

Continuation of Ser. No. 122,975, March 10, 1971, abandoned. This application Feb. 8, 1973, Ser. No. 330,573
Int. Cl. A63c *19/12*
U.S. Cl. 47—29 **2 Claims**

1. A flat panel usable as or in a turf protection cover, comprising an envelope of synthetic plastics material which contains expanded polystyrene, such envelope being transparent to sunlight and the expanded polystyrene being of a maximum thickness of 1 inch to permit the passage of sunlight therethrough so that the panel can be used to protect turfted areas, whilst allowing sunlight to the grass, and being light enough to permit growth of the grass whilst the cover is in position, said envelope being formed of two sheets of synthetic plastics

which are welded together at the edges and wherein the peripheral region defined by said edges has eye holes by which

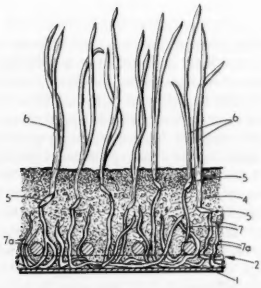


the panel may be pegged to the ground to hold same in position.

3,863,388
GROWING OF GRASSES

Frederick Walter Loads, Brookhouse, near Lancaster, England, assignor to F. B. Mercer, Limited, Lancashire, England

Continuation of Ser. No. 179,140, Sept. 9, 1971, abandoned. This application Sept. 14, 1973, Ser. No. 397,279
Claims priority, application Great Britain, Sept. 10, 1970, 43457/70
Int. Cl. A01g *1/00*
U.S. Cl. 47—56 **5 Claims**

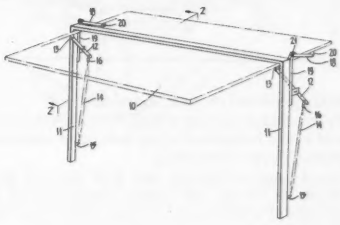


1. A method of producing a grass bearing lamina comprising a sheet of flexible plastic reticulate structure composed of a first set of strands of single filaments positioned transversely to a second set of strands of single filaments to form a rectangular mesh of about ¼ inch directly in contact with a surface impermeable to penetration by plant roots, the form of the reticulate structure being such that when placed in direct contact with said surface, shallow spaces are present between said surface and at least one of said sets of strands, distributing over the surface of the reticulate structure a layer of rooting medium containing an adequate quantity of grass seed of the selected variety or varieties, and subjecting the lamina to correct conditions of light, heat and moisture to effect rapid germination whereby the conducting roots from each seed grow through the layer of rooting medium lying above the reticulate structure, through the meshes in the reticulate structure, so that the the root system so produced bonds the rooting medium and the reticulate structure into a coherent unit of flexible laminar structure having at one surface growing grass blades and at the other surface a root structure which will strike and grow into an earth surface on which the lamina is laid.

3,863,389
LIFT UP GARAGE DOORS

Peter Tunjic, 19 Brisbane St., Eltham, Victoria, Australia

Filed Jan. 19, 1973, Ser. No. 325,117
Claims priority, application Australia, Jan. 19, 1972, 7706/72
Int. Cl. E05d *15/40*
U.S. Cl. 49—205 **2 Claims**



1. An attachment for a lift-up door of the spring assisted type for use in a door opening having a pair of column members one on each side of the opening, said attachment comprising:

a pivot pin adapted to be mounted at a fixed position on each of said column members;

a lever arm pivotally mounted on each of said pins at a position intermediate opposite ends of said lever arm, one end portion of each of said lever arms having means adapted to be connected to a tension spring for biasing said lever arms about said pivot pins to a substantially upright position, the opposite end portion of each of said lever arms being adapted to be connected to the door when in use at a point on one side of the line of the opening when the door is in the UP position; and

a pair of rigid link members each having at one end thereof means adapted to be pivotally mounted one at each side at a fixed position on said door at a point on the other side of the line of the opening when the door is in the UP position, each of said link members having at the opposite end thereof means, fixed in relation to said pivot pins at a position above the uppermost level of said door, adapted to be pivotally mounted adjacent the top of each column member for preventing simple downward pivoting of the bottom of said door when said door is in the UP position, said link members providing means when said door is in the UP position for allowing the top of said door to pivot downwardly in a first relatively minor arc constituting a first closing stage of the door, said first arc being opposite to the direction of the eventual relatively major closing arc of the door constituting the second and final closing stage of the door and wherein the bottom of the door is pivoted downwardly.

3,863,390
DOOR OPERATING MECHANISM

Joseph Sawdai, Ross Twsp., Allegheny Cty., Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

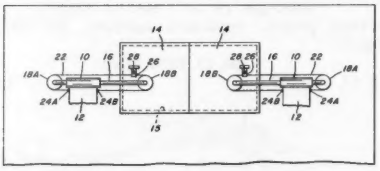
Filed Mar. 16, 1973, Ser. No. 341,826
Int. Cl. E05f *15/06, 15/14*
U.S. Cl. 49—360 **7 Claims**

1. Apparatus for opening and closing a doorway comprising: at least one door mounted for lateral sliding movement into and out of a doorway closing position;

a fixed base adjacent and spaced from at least one side of said doorway;

a linear motion device fixed to each said base;

connecting means comprising a rigid rod adapted to be linearly driven by said linear motion device in the direction of said door movements, said rod having ends thereof exterior to said device;



a pulley journaled on each end of said rod;

a flexible strand passing around both pulleys, both ends of said strand being fixed to the base upon which said linear motion device is mounted;

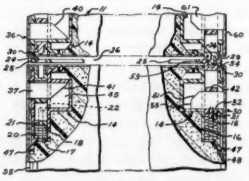
a strand clamp connecting said door and said strand, and means to actuate said linear motion device to cause movement of said door in a desired direction into or out of a doorway closing position.

3,863,391

REVERSIBLY MOUNTED CABINET DOOR

Julius B. Horvay, Louisville, Ky., and John M. Powell, Charlestown, Ind., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 10, 1973, Ser. No. 423,205
Int. Cl. E05d *7/02*
U.S. Cl. 49—382 **3 Claims**



1. An arrangement for reversibly mounting a door on a cabinet including:

a first pair of hinge pins supported adjacent the upper and lower ends of the door adjacent one side thereof;

a second pair of hinge pins supported adjacent the upper and lower ends of the door adjacent the other side thereof;

means cooperating with each of said hinge pins to continuously bias each of said hinge pins to a position extending beyond the peripheral edge of the door;

first support means on the cabinet to receive in supporting engagement each of said hinge pins adjacent the upper end of the door when each of said hinge pins is in an extended position;

second support means on the cabinet to receive in supporting engagement each of said hinge pins adjacent the lower end of the door when each of said hinge pins is in an extended position;

removably disposed means mounted on one of the sides of the door to retract each of the hinge pins on the one side of the door from said first and second support means when said removably disposed means is disposed on the door so that said retracted hinge pins are retracted from supporting engagement with said first and second support means, said removably disposed means comprising a single longitudinal member having first and second means for cooperation with each of said hinge pins on the one of the sides of the door and said single longitudinal member of said removably disposed means being secured to the door to serve as the handle for the door; and

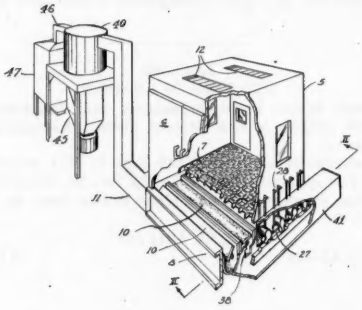
removable means on the other side of the door from the side having said removably disposed means for locking each of said hinge pins on the other side of the door in its extended position and supporting the bottom edge of the door in spaced relationship to the adjacent hinge plates.

3,863,392

SAND BLAST ROOM

Leroy C. Haker, 1011 Rice Rd., Elma, N.Y. 14059

Filed Mar. 21, 1974, Ser. No. 453,203
Int. Cl. B24c *9/00*
U.S. Cl. 51—8 R **6 Claims**



1. Apparatus for performing sand blasting operations comprising a sand blast room having a grid-like floor through which abrasive materials may fall during sand blasting, a plurality of parallel channels beneath said floor for receiving said materials, means for covering the upper sides of said channels and movable between channel closing and channel opening positions, said channels having air inlet openings at one end of each and duct means communicating with the opposite ends of said channels, suction means connected to said duct means for causing air flow through said channels to said suction means, and means for alternately opening and closing said channel covering means to produce maximum horizontal air flow through said channels when said means are closed and for producing purifying air flow downwardly from said room and through said floor when said means are open.

3,863,393

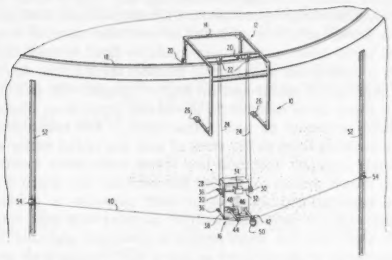
APPARATUS FOR SUPPORTING WORK MEANS ON VERTICALLY DISPOSED SURFACE

James R. Goff, Oklahoma City, Okla., assignor to Robert J. Nelson, Oklahoma City, Okla.

Filed Mar. 13, 1972, Ser. No. 233,968
Int. Cl. B24c *3/06, 3/32*
U.S. Cl. 51—9 **17 Claims**

1. A support apparatus adapted to be used in conjunction with a vertically disposed surface comprising a vertical support frame positioned above at least a portion of said vertically disposed surface; at least one flexible vertical support member attached to said vertical support frame; a depending means adapted to attach to and supported by said flexible vertical support member; ppositioning means extending from said depending means adapted to contact said vertically disposed surface; and a flexible track means extending in a horizontal direction which contacts said vertically disposed surface at

least at one location and which contacts said depending means whereby the contacting of said flexible track means forces said



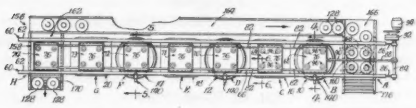
positioning means into contact with said vertically disposed surface.

3,863,394

APPARATUS FOR MACHINING WORK PIECES

Raymond E. Dumentat, Carlyle, Ill., assignor to Speedfam Corporation, Des Palines, Ill.

Filed Feb. 4, 1974, Ser. No. 439,318
Int. Cl. B24b *7/06*
U.S. Cl. 51—109 R **11 Claims**



1. Apparatus for finishing the surface of work pieces and defining at least two horizontally spaced apart work stations, comprising a rotatable member with a horizontal operating surface disposed at one of said work stations for engagement by work pieces, carrier means movable horizontally above said two work stations, means for reciprocally moving said carrier means between said two work stations, at least one horizontally disposed plate means to which at least one work piece is adapted to be secured on the underside thereof, vertically disposed power actuated means carried by said carrier means for selectively raising and lowering said plate means, said power actuated means selectively serving to transfer said plate means and work piece secured thereto from one of said work stations to the other of said work stations upon movement of said carrier means, and said power actuated means selectively serving to apply downward pressure on said plate means to forcibly urge the work piece secured thereto against said horizontal operating surface of said rotatable member.

3,863,395

APPARATUS FOR POLISHING A SPHERICAL SURFACE ON A MAGNETIC RECORDING TRANSDUCER

David A. Brown, Los Gatos, Calif., assignor to Shugart Associates, Inc., Sunnyvale, Calif.

Filed Feb. 19, 1974, Ser. No. 443,626
Int. Cl. B24b *7/00, 9/00;* **B24d** *11/00*
U.S. Cl. 51—121 **19 Claims**

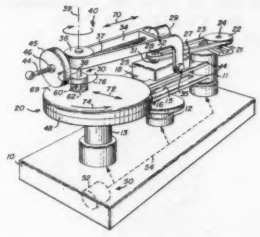
1. Apparatus for polishing a substantially spherical work surface of a workpiece comprising:

means forming a polishing pad including a rotatable base having a flat upper surface, at least one layer of resilient material disposed on said flat surface, and a flexible abrasive sheet overlaying the upper surface of said one layer and forming a resilient abrasive surface;

a workpiece holder disposed above said polishing pad for rotating said workpiece while urging said work surface against said abrasive surface with a substantially uniform contact pressure;

an oscillatory motion generator for causing said holder to move in random fashion across said abrasive surface; and

drive means for supplying driving energy to said polishing



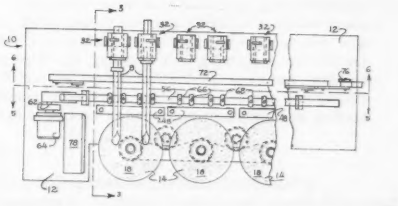
pad, said holder and said oscillatory motion generator, whereby polishing of said work surface is accomplished by the conforming engagement of said abrasive surface thereto as said workpiece is rotated and randomly moved across the upper surface of said polishing pad.

3,863,396

APPARATUS FOR GRINDING CONCRETE BITS OR THE LIKE

Billie E. Holt, Route 1 Box 427, Graham, N.C. 27253

Filed July 16, 1973, Ser. No. 379,619
Int. Cl. B24b *7/02*
U.S. Cl. 51—124 R **9 Claims**



1. Apparatus for grinding elongate concrete bits having worn forward ends, comprising:

frame means;

at least one grinding wheel having a radial grinding face;

means on said frame mounting said wheel for rotation about a substantially vertical axis with said face thereof facing upwardly and extending generally horizontally;

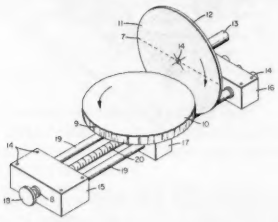
means for imparting said rotation to said wheel during operation of the apparatus;

bit mounting means spaced laterally from said grinding wheel for pivotally mounting a plurality of concrete bits adjacent the rear end portions thereof in longitudinally fixed and forwardly and downwardly inclined relationship to said face of said grinding wheel, with the forward ends of said bits overlying said face for engagement therewith during a grinding operation, for free vertical movement of said forward ends of said bits relative to said grinding wheel face and for lateral movement of said forward ends of said bits generally radially of said grinding wheel face toward and away from its central axis;

and power-operated means engagable with said concrete bits intermediate said bit mounting means and said grinding wheel for simultaneously imparting, during operation of the apparatus, said lateral movement to said forward

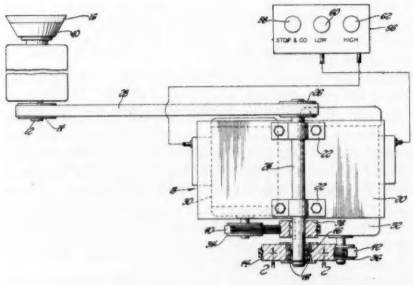
ends of said bits to regulate the temperature and prevent overheating thereof.

3,863,397
WOODWORKING JIG
Arnold B. Reitz, 3735 Capri Dr., Santa Barbara, Calif. 93105
Filed Jan. 18, 1974, Ser. No. 434,442
Int. Cl. B24b *5/00, 29/00*
U.S. Cl. 51—131 **3 Claims**



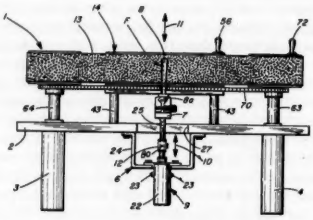
1. A woodworking jig for producing a smoothly round wooden workpiece, comprising:
- a pair of end castings for mounting in a fixed position on a stable surface, said end castings having at least one unthreaded guide rod and a threaded drag rod attached therebetween;
- a floating casting having a threaded internal bore for receiving said threaded drag rod and at least one unthreaded internal bore for receiving said at least one unthreaded internal guide rod, said floating casting having a male drive shaft affixed thereto on the upper side thereof;
- a chuck for detachable attachment to the center region of a workpiece, said chuck having a female extension for rotatably fitting over said male drive shaft; and
- a planar member rotatably attached to said stable surface, said planar member having a sanding disk attached thereto for contacting and abrading the edge of said wooden workpiece so that movement of said floating casting will force said wooden workpiece against said sanding disk and cause said wooden workpiece to rotate.

3,863,398
TWO SPEED GRINDING MACHINE
Richard M. Moser, Lincoln Park; Edward T. Kantarian, Royal Oak, and Raymond F. Nixon, Bloomfield Hills, all of Mich., assignors to Moni, Inc., Dearborn, Mich.
Filed May 14, 1973, Ser. No. 359,808
Int. Cl. B24b *47/10*
U.S. Cl. 51—134.5 **4 Claims**



1. A grinding machine comprising: a spindle; a grinding wheel mounted on said spindle; and a dual motor drive means connected with said spindle operable to rotate said spindle at a selected one of two speeds; said drive means comprising: a base member; an output shaft rotatably supported on said base member; means drivingly connecting said output shaft with said spindle; a high speed motor mounted on said base member; a low speed motor mounted on said base member; a high speed input drive member non-rotatably fixed to said output shaft; a high speed power drive member fixed to the shaft of said high speed motor and drivingly engaged with said high speed input drive member; a low speed input drive member rotatably mounted on said output shaft; a low speed power drive member fixed to the shaft of said low speed motor and drivingly engaged with said low speed input drive member; and a clutch means connected between the low speed input drive member and said output shaft operable to drivingly engage said low speed input drive member with said output shaft when said low speed motor is energized and said high speed motor is deenergized to cause said output shaft to be driven by said low speed motor, said clutch means being operable to disengage said low speed input drive member from said output shaft to permit free rotation between said output shaft and low speed input drive member when said high speed motor is energized and said low speed motor is deenergized, said clutch means being connected between said low speed input drive member and said output shaft such that said output shaft is driven in the same direction by both said high speed and low speed motors.

3,863,399
APPARATUS FOR FINISHING A FOIL
Oakley Cowdrick, 5079 Strawberry Ln., Willoughby, Ohio 44094
Filed Mar. 15, 1974, Ser. No. 451,573
Int. Cl. B24b *69/00*
U.S. Cl. 51—151 **13 Claims**

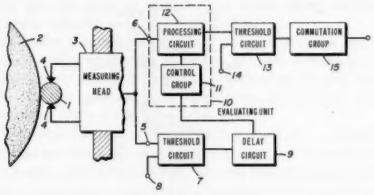


1. An apparatus for finishing the edge of a foil comprising, a support structure,
- a finishing material mounting means on said support structure having a finishing material mounted thereon,
- a reciprocating jig means mounted on said support structure for holding said foil with said edge in exposed, confronting relation to said finishing material,
- said jig means including a rotatable jig head to enable said foil to rotate about its lengthwise axis when in the mounted position, and
- cam relief means yieldably supporting said finishing material in camming coacting engagement with said edge to impart an oscillatory rotating movement to said foil upon reciprocating movement of said jig means for providing a smooth finish for said edge of said foil.

3,863,400
DEVICE FOR CONTROLLING THE APPROACH SPEED IN MACHINE TOOLS PARTICULARLY GRINDING MACHINES

Roberto Rossi, Bologna, Italy, assignor to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C., Via Saliceto, Italy

Filed May 31, 1973, Ser. No. 365,733
Claims priority, application Italy, June 6, 1972, 3451/72
Int. Cl. B24b 49/02
U.S. Cl. 51—165.77 6 Claims

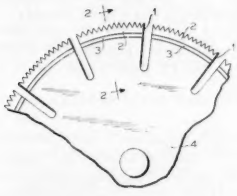


1. A device for controlling the approach speed of the tool towards the pieces to be machined in machine-tools, particularly grinders, comprising gauging means, adapted to provide a signal responsive to the actual size of the workpiece; a processing unit connected with said gauging means and adapted a process said signal responsive to size, for providing a signal responsive to the rate of size change; and a commutating group, operated by said unit, to control, at the time of contact between tool and piece, the passage from approach speed to feed speed.

3,863,401
DIAMOND ABRASIVE CUT-OFF WHEEL

Henry Schwarzkopf, Westchester, and John J. Bouvier, Tonawanda, both of N.Y., assignors to Ferro Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 153,501, June 16, 1971, abandoned. This application Dec. 21, 1973, Ser. No. 427,065
Int. Cl. B24b 5/00, 3/02
U.S. Cl. 51—206.4 6 Claims

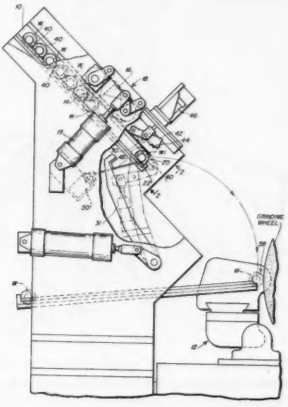


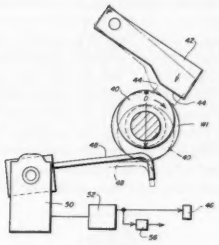
1. In a circular, diamond abrasive, segmented cutting member having an arbored, central support and drive disc, a multiplicity of arcuate cutting segments affixed thereto about the periphery thereof, said segments comprising a diamond support matrix having diamond particles therethroughout, and having substantially planular side surfaces, the improvement of the outer, peripheral cutting surface of said segments being substantially, unidirectionally, uniformly serrated in the form of ridges having sloping faces, and a multiplicity of said diamond particles oriented with a plan thereof coincident with the sloping faces of said ridges.

3,863,402
WORKPIECE ORIENTING DEVICE FOR A MACHINE TOOL

Ralph E. Price, Waynesboro, Pa., assignor to Landis Tool Company, Waynesboro, Pa.

Filed Feb. 1, 1974, Ser. No. 438,549
Int. Cl. B24b 49/08, 5/16; B65b 9/08
U.S. Cl. 51—216 ND 4 Claims



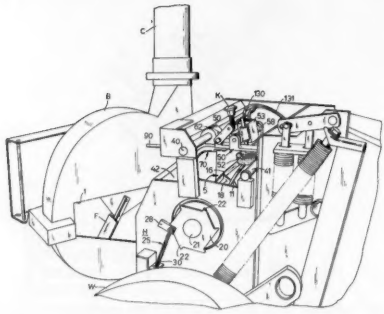


1. A workpiece orienting device comprising
means for supporting a randomly oriented workpiece, having an eccentric portion to be ground to size, for selective engagement with a pair of work centers,
a pair of work centers,
means for forcefully engaging a supported workpiece with said work centers,
motor means for rotatably driving at least one of said work centers,
orienting means selectively located to be radially aligned with the eccentric portion of a supported workpiece and displaceable from a retracted remote position to an advanced position, said advanced position being selectively located so that the eccentric portion of the rotating workpiece will strike said orienting means at a predetermined location,
means for advancing said orienting means from said retracted position to said advanced position,
means for sensing when said orienting means can be advanced from said retracted position to said advanced position without abutting against the eccentric portion, and for actuating said advancing means,
means for maintaining said orienting means at said advanced position whereby rotation of the rotating workpiece will be halted when the eccentric portion engages said orienting means thereby establishing a predetermined workpiece orientation.

3,863,403
BLADE SHARPENING DEVICE FOR ROTATABLE CHOPPING CYLINDERS INCLUDING HYDRAULIC DRIVE MEANS

Philip F. Fleming, West Bend, Wis., assignor to Gehl Company, West Bend, Wis.

Filed Feb. 25, 1974, Ser. No. 445,677
Int. Cl. B24b 3/42, 47/14
U.S. Cl. 51—249 4 Claims

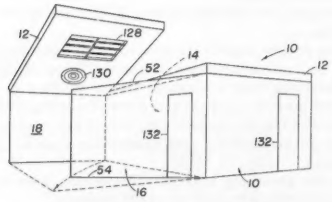


1. A blade sharpening device for use with a forage harvester having a housing and a cutting rotatably retained within the housing and having a plurality of circumferentially spaced spiral shaped cutting blades, the sharpening device comprising: guide track means supported on said housing, a carriage movably supported on said track means for movement generally parallel to the cylinder axis, a grinding wheel on the carriage and engagable with one of said cylinder blades, a hydraulic motor connected to and for driving said grinding wheel, and a hydraulic circuit for supplying controlled pressure fluid to and from said motor, said circuit including a fluid pressure pump, a control valve for receiving pressure fluid from said pump and delivering it to said motor, and an excess flow check valve and also and adjustable needle valve both located between said control valve and said hydraulic motor.

3,863,404
BUILDING CONSTRUCTION

Carl D. Wahlquist, Woodland Hills, Calif., assignor to Building Components Research, Inc., Salt Lake City, Utah

Filed Aug. 9, 1973, Ser. No. 386,900
Int. Cl. E04b 1/344
U.S. Cl. 52—27 6 Claims



1. A building structure comprising in combination:

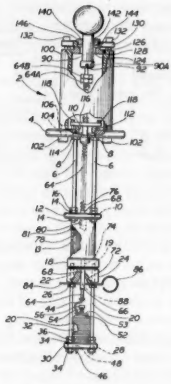
a generally vertically oriented folding wall panel mounted upon a rigid support wall so as to provide limited movement of the wall panel in the vertical plane;

a ceiling unit suspended above the wall panel, the ceiling unit comprising means for selectively lowering at least part of the weight of the ceiling unit upon the unfolded wall panel; and means interposed above and below the wall panel for forming a seal when the weight of the ceiling unit is brought to rest upon the wall panel.

3,863,405
SELF-ERECTING TUBE DEVICE

Leigh David Leiter, Willow Grove, Pa., assignor to Ametek, Inc., New York, N.Y.

Filed Jan. 25, 1974, Ser. No. 436,697
Int. Cl. B65h 75/24
U.S. Cl. 52—108 8 Claims



1. In a self-erecting tube having a helical axially extending ribbon of spring material with adjacent turns set to coil tightly in overlapping and telescoping engagement and mounted on a base,

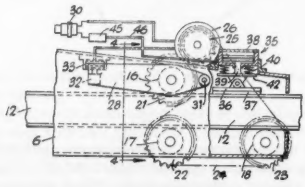
a converging-diverging nozzle for guiding the tube during erection and tightly engaging the tube on full erection, and

a second converging-diverging nozzle spaced from the first mentioned nozzle for guiding the tube during erection and tightly engaging the tube on full erection.

3,863,406
DRIVE MECHANISM FOR JIB CRANES

Donald J. Quick, West Bundaberg, Queensland, Australia, assignor to International Harvester Company, Chicago, Ill.

Filed Oct. 9, 1973, Ser. No. 404,550
Claims priority, application Australia, Oct. 9, 1972, 748/72
Int. Cl. B66c 23/64
U.S. Cl. 52—115 3 Claims



1. In a crane having an elongated cantilevered main jib of the box type construction, an extendable and retractable elongate extension jib of uniform rectangular cross section telescopically mounted within the main jib, hydraulic power means including means for selectively energizing the power means for telescopically extending and retracting the extension jib, and securing means for holding the extension jib in

place following telescopic movement, the improvement comprising:

a U-shaped lever having the ends of the extending arms of the U hinged to the lateral sides of the main jib and the cross-member of the U passing transversely through the lateral sides of the main jib;

a first roller mounted on a first shaft passing transversely through the lateral sides of the main jib and being journalled to the arms of the U-shaped lever, the first roller sitting on top of the extension jib;

a second roller mounted on a second shaft passing transversely through and being journalled to the latteral sides of the main jib and supporting the bottom of the extension jib, the axis of the second shaft being vertically aligned with the axis of the first shaft;

a third roller spaced horizontally from and parallel with the second roller and being mounted on a third shaft passing transversely through and being journalled to the lateral sides of the main jib and supporting the bottom of the extension jib;

a pulley wheel keyed to each shaft including a continuous belt means drivingly connecting the pulley wheels to the hydraulic power means for rotating the rollers in unison and telescopically moving the extension jib upon energization of the hydraulic power means;

a brake shoe sitting on top of the extension jib in the space between the vertical planar axes of the second and third shafts;

first and second hydraulic power ram means mounted on the main jib and each having first and second piston rod means respectively and being hydraulically connected to the hydraulic power means for simultaneous energization of the piston rod means with the power means, the first piston rod means being connected to the brake shoe for lifting the brake shoe from the extension jib upon energization thereof, the second piston rod means being connected to the cross-member of the U for swinging the arms of the U upon energization thereof and squeezing the extension jib between the rotating rollers; and

spring means between the brake shoe and the first piston rod means for pressing the brake shoe against the top of the extension jib upon the simultaneous de-energization of the hydraulic power means and piston rod means for halting the movement of the extension jib.

3,863,407

TELESCOPIC CRANE JIB

Harry Eucken, Hochdahl-Millrath, Germany, assignor to Leo Gottwald, K.G., Dusseldorf-Holthausen, Germany

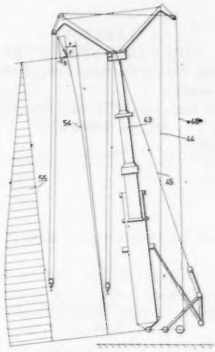
Continuation of Ser. No. 225,566, Feb. 11, 1972, abandoned. This application Oct. 29, 1973, Ser. No. 410,400

Claims priority, application Germany, Feb. 13, 1971, 2106983

Int. Cl. E04h *12/34;* **B66f** *11/02*

U.S. Cl. 52—115 **24 Claims**

1. In a telescopic crane jib including an axially elongated jib housing, a plurality of axially elongated individual telescopic parts selectively displaceable between a fully retracted position with all of said parts within said housing and a number of extended positions and during the extending and retracting operations said jib housing and telescopic parts are arranged approximately vertically, and means for positively locking said telescopic parts together in the extended positions, wherein the improvement comprises that each said telescopic part comprises a base at its lower end extending transversely of its elongated direction, a rim at its upper end extending transversely of its elongated direction, and sides extending in its elongated direction between said base and said rim, said sides of said telescopic parts being disposed in spaced relationship so that there is no mutual guiding between said telescopic parts, said positive locking means being located in said base and said rim of said telescopic parts and when said telescopic parts are interconnected in the extended position, said base of the upper said telescopic part is located in the same plane with said rim of said lower telescopic part so that there is no overlapping of said telescopic parts in the extended position, said jib housing having a length at least equal to twice the length



of each of said telescopic parts, and releasable catch means located at the upper end of said jib housing and arranged to hold at least one of said telescopic parts in a position within said housing spaced upwardly from the lower end of said housing.

3,863,408

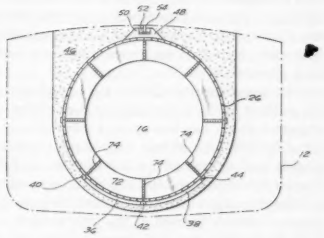
PRESTRESSED CONCRETE TANKS FOR LIQUID NATURAL GAS TANKERS

John J. Closner, Douglaston; Tadeusz Josef Marchaj, New York, and Sven Hjalmar Wichman, Yaphank, all of N.Y., assignors to Preload Technology, Inc., Garden City, N.Y.

Filed Sept. 27, 1972, Ser. No. 292,727

Int. Cl. E04c *3/26*

U.S. Cl. 52—224 **14 Claims**



1. A tank for cryogenic adapted for placement within a marine transportation vessel comprising:

a. a concrete, cylindrical tank wall having a plurality of steel prestressing tendons located therein in axial orientation;

b. a steel sheath anchored to the exterior surface of said wall;

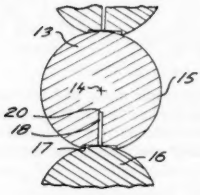
c. a prestressing tendon wrapped essentially circumferentially about the exterior of said steel sheath;

d. at least two, annular stiffening disks positioned coaxially within the said wall said disks having holes therein for through-passage of axially oriented prestressing tendons;

e. a plurality of stiffening plates positioned radially-axially with respect to said tank and abutting at both axial extensions thereof, said stiffening disks and at their radial outermost extension, the said cylindrical tank wall, said

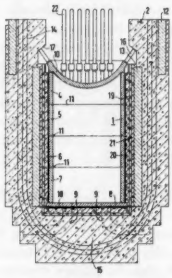
stiffening plates having essentially axially oriented prestressing tendons therein;
f. steel heads defining the ends of said cylindrical tank and attached to said stiffening disks; and
g. inlet and outlet means for said cryogenic liquid.

3,863,409
LOG CABIN STRUCTURE
Charles Raymond Fell, P.O. Box. 218, Hudson Hope, British Columbia, Canada
Filed Dec. 11, 1972, Ser. No. 313,944
Int. Cl. E04b *1/10*
U.S. Cl. 52—233 **10 Claims**



1. A portion of a log cabin wall structure, comprising:
a. an elongated first wall element having a substantially cylindrical cross section,
b. an elongated second wall element having a substantially cylindrical cross section and disposed immediately below and in alignment with the first wall element,
c. locking means disposed along the lowermost surface of the first wall element for firmly engaging and holding the first wall element in superposed relation with the second wall element,
d. the locking means including a recessed horizontal planar supporting surface for directly supporting the first wall element which has two spaced substantially perpendicular side walls, the planar supporting surface directly engaging and supported on the uppermost peripheral section of the cylindrical surface of the second wall element,
e. the locking means also including laterally spaced groove corners formed at the intersection of the spaced side walls with the cylindrical surface of the first wall element, said groove corners disposed below the horizontal planar supporting surface and which are resiliently urged into sinking engagement with the cylindrical surface of the second wall element,
f. a longitudinally extending radial slot disposed perpendicular to the horizontal planar supporting surface and having a length approximately one-third the radius of the wall element so as to permit resilient lateral spreading of the groove corners,
g. the distance between the groove corners before engagement with the cylindrical surface of the second wall element being slightly less than the cordal distance between the two opposed points of engagement with the laterally spread groove corners after the horizontal planar supporting surface comes into engagement with the cylindrical surface of the second wall element.

3,863,410
PRESSURE-TIGHT REACTOR TANK
Heinrich Dorner, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed Dec. 18, 1972, Ser. No. 315,867
Claims priority, application Germany, Dec. 23, 1971, 2164127
Int. Cl. G21c *13/00*
U.S. Cl. 52—249 **7 Claims**

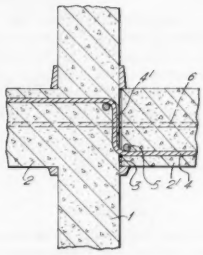


1. A nuclear reactor pressure tank having a cylindrical steel wall and a concrete wall surrounding this steel wall; wherein the improvement comprises said steel wall being formed by a plurality of cylindrical steel rings each of which has a cylindrical wall having opposite ends and strong enough in the radial direction to be pressure-tight with respect to the reactor internal pressure, said rings being stacked with mutually adjacent pairs of their said ends in abutting relationship to form said cylindrical steel wall, one of said rings forming a lowermost ring with one of its said ends forming a bottom end, a substantially flat steel bottom wall supporting said lowermost ring's said bottom end, said concrete wall being formed by concrete forming a cylindrical wall encircling said cylindrical steel wall and radially spaced at least slightly from the latter, said concrete further forming a bottom concrete wall beneath said steel bottom wall, another of said steel rings forming an uppermost ring with one of its said ends forming a top end, said cylindrical concrete wall having a portion extending upwardly to a level above said top end, a steel cover for said top end and resting thereon, and means between said concrete wall's upper portion and said cover for creating pressure therebetween so that said cover presses downwardly on said top end of said uppermost steel ring, holding all of said rings axially pressed together and towards and on said steel bottom wall.

3,863,411
ARRANGEMENT AT AN EXPANSION JOINT
Olav Selvaag, Holmenveien 19, Oslo 3, Norway
Continuation of Ser. No. 179,435, Sept. 10, 1971, abandoned. This application July 20, 1973, Ser. No. 381,002
Claims priority, application Norway, Sept. 18, 1970, 3562/70
Int. Cl. E04b *1/60, 1/68*
U.S. Cl. 52—251 **4 Claims**

1. A connecting and support arrangement for an expansion joint between a supporting wall and an adjacent floor section of a building, which joint separates the building along planes which extend across the direction of expansion, said arrangement comprising at least one supporting member which includes first and second substantially horizontal portions respectively incorporated in the supporting wall and the adjacent floor section and which connects the wall and floor section together, said supporting member also including a further substantially vertical portion which connects said horizontal portions together and is disposed adjacent to the expansion joint and extends therealong a substantial distance, parallel to the plane thereof and which absorbs vertical forces between

the wall and floor section; and at least one further, horizontally extending mild steel reinforcement member incorporated in the wall and floor section of the building which connects the



wall and floor section together and which yields when the tension forces thereon, resulting from expansion or contraction of the building, exceed a predetermined level.

3,863,412

EASILY DISMANTLED PARTITION STRUCTURE

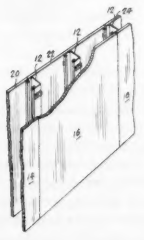
Alistair K. Bodycomb, Baie d'Urfe, Quebec; Samuel P. Meiel, Roxboro, Quebec; Cameron W. Shebry, and Garth N. Thompson, both of Dorion, Quebec, all of Canada, assignors to Domtar Limited, West Montreal, Canada

Filed Apr. 23, 1973, Ser. No. 353,710

Claims priority, application Canada, June 26, 1972, 145756

Int. Cl. E04b *2/82*

U.S. Cl. 52—483 **4 Claims**



1. A partition structure comprising stud means, a plurality of discrete spaced fastening elements secured to said stud means, a substantially rigid wall panel, co-operating fastening elements secured to said panel and positioned to co-operate with the fastening elements on said stud means, one of said fastening elements and said co-operating fastening elements being in the form of a plurality of loops the other in the form of a plurality of T-shaped hooks formed from plastic and adapted to hook into said loops thereby to secure said panlel to said stud means, said loops being small and said hooks being substantially rigid and having short stems, said hooks and loops being interposed between said panel and said stud means, and constituting means for inhibiting relative movement between said panel and said stud means.

3,863,413

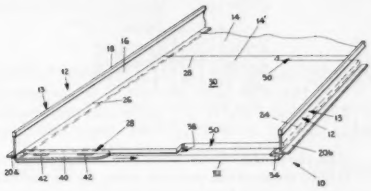
SUSPENDED CEILING CONSTRUCTION

Henry Moomey, Kentwood, Mich., assignor to Harvey J. Geute, Spring Lake, Mich.

Filed Oct. 19, 1973, Ser. No. 407,802

Int. Cl. E04b *5/55*

U.S. Cl. 52—484 **6 Claims**



1. A suspended ceiling construction for a structure comprising:

a plurality of evenly spaced, parallel support beams mounted in the structure, each support beam comprising front and back ceiling tile support means on front and back sides thereof;

a plurality of removable ceiling tiles supported in rows between adjacent front and back support beams, each ceiling tile comprising:

a back edge having kerf means adapted to engage the front support means on the back support beam so as to hold the back edge in place on the back support beam; a front portion adjacent the back support means on the front support beam, but being disengaged from supporting engagement with said back support means; and opposing side edges that abut the side edges of adjacent tiles in the same row of ceiling tiles said side edges having longitudinal kerfs formed therein;

locking means slidably mounted in the kerfs in the abutting side edges of adjacent tiles, each locking means being slidable between a locked position, wherein the locking means engage the back support means of the front support beam and holds the front portions of the adjacent ceiling tiles in place against said front support beam, and a released position, wherein the locking means are disengaged from said back support means, thereby releasing the said front portions from the front support means; and at least one access tile comprising a ceiling tile having an open section above the kerf on each side of the tile, said open section being formed so that the locking means in the sides of the access tile will fit through said open sections when the locking means are in their released positions,

whereby, access tiles may be removed by sliding the locking means therein to their released positions and then lowering the tile away from the locking means and disengaging the back edge of the tile from the back support beam.

3,863,414

VOID SYSTEM FOR CONCRETE WITH AGGREGATE HAVING PROJECTING MEMBERS

Edward D. Dunn, Jr., Albany, Ga., assignor to Versatile Structures, Incorporated, Leary, Ga.

Filed Dec. 29, 1972, Ser. No. 319,739

Int. Cl. E04c *5/01*

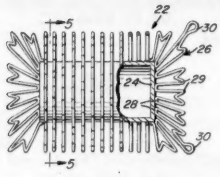
U.S. Cl. 52—659 **1 Claim**

1. An aggregate for concrete, comprising, in combination:

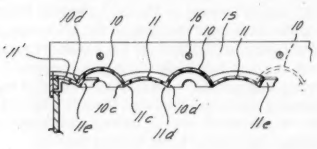
a. a watertight element having watertight walls defining a watertight void, the element being a hollow cylinder provided with a cylindrical wall and a pair of end walls; and

b. a plurality of members arranged emanating outwardly from the element, the members being portions of a plurality of continuous wire attached to the walls of the cylinder, with a plurality of spaced one of the wires being

arranged in substantially parallel planes about the cylindrical wall, the member forming portions being bent away from the element and provided with undulations intermediate the points of attachment of the associated wire, and at least some of the portions being further provided with a loop arranged for tying the aggregate to other aggregate and to conventional concrete reinforcing rods.



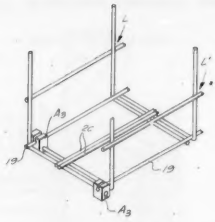
3,863,415
AWNING OR MARQUEE
Winston F. Bott, 1915 N. Lexington Blvd., Corpus Christi, Tex. 78409
Filed Aug. 22, 1972, Ser. No. 282,866
Int. Cl. E04c *2/32*; **E04b** *1/34*
U.S. Cl. 52—630 **14 Claims**



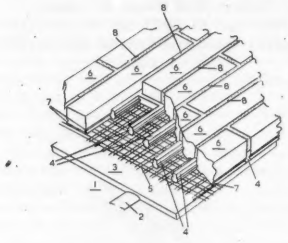
1. An awning for a building, comprising:
a first partial conical convex longitudinally extending section formed of a substantially rigid molded material and having its smaller portion at its upper end and its larger portion at its lower end;
a second partial conical convex longitudinally extending section disposed adjacent and laterally with respect to said first partial conical section with its smaller portion at its lower end adjacent said larger portion of said first section and with its larger portion at its upper end adjacent said smaller portion of said first section;
said first section and said second section having adjacent longitudinal edges secured together and forming a unitary awning section; and
said first section having a radius of curvature less than the radius of curvature of said second section whereby said second section is flatter than said first section to resist essentially lateral wind load thereon while the curvature thereof provides strength against bending.

3,863,416
CONCRETE REINFORCEMENT
Georgi Oroschakoff, Simon-Denk-Gasse 7/7, Vienna IX, Austria
Continuation-in-part of Ser. No. 93,822, Nov. 30, 1970, Pat. No. 3,778,951. This application Dec. 17, 1973, Ser. No. 425,627
Int. Cl. E04c *2/42*; **E04b** *12/18*
U.S. Cl. 52—646 **10 Claims**

1. A concrete reinforcement for beams, columns and the like, comprising a pair of L-section reinforcement elements each comprising a plurality of longitudinally spaced L-shaped transverse bars lying in respective parallel planes, a first longitudinal bar secured to said transverse bars at the bends thereof and extending perpendicular to said planes, and a second longitudinal bar secured to codirectionally extending legs of the transverse bars and spaced from said first longitudinal bar, said elements having said codirectionally extending legs interdigitating and lying in a common plane parallel to said longitudinal bars with said second longitudinal bars of the two elements laterally abutting, and clips interconnecting the first longitudinal bar of one element and a leg of the other element.



3,863,417
MARINE DECKING
Vicenzo Franchi, Hornsey, England, assignor to Franchi Wood Mosaic Company Limited, London, England
Filed Mar. 19, 1973, Ser. No. 342,480
Claims priority, application Great Britain, Mar. 21, 1972, 13088/72
Int. Cl. E04f *15/16*
U.S. Cl. 52—741 **3 Claims**

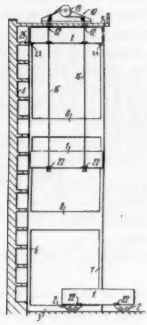


1. The method of laying marine decking on a deck area, comprising forming dovetail grooves along the lower edges of wood blocks, securing together a plurality of said wood blocks in mutually spaced relationship to form a panel, spreading a bedding composition on the deck area, pressing said panel of wood blocks into said bedding composition before the latter has set such that the bedding composition passes up between said wood blocks as said panel is pressed, allowing said bedding material to set such that the set bedding material cooperates with said dovetail grooves to retain said wood blocks on said deck area, and applying a grouting material between said wood blocks.

3,863,418
BUILDING METHOD
Pierre Faucheux, Paris, France, assignor to Etablissements Fresa, Liechtenstein, Vaduz, Liechtenstein
Filed Jan. 30, 1973, Ser. No. 328,118
Claims priority, application France, Feb. 1, 1972, 72.1489; Switzerland, Feb. 11, 1972, 2006/72
Int. Cl. E04b *1/343*; **E04g** *21/14*
U.S. Cl. 52—745 **1 Claim**

1. A method of constructing a multiple-story building comprising the steps of:

a. erecting a vertical concrete structure having a plurality of walls defining an interior access well extending the height of the building;
b. providing a plurality of horizontal landings projecting outwardly from at least one of said walls of said concrete structure and corresponding in number to the number of stories of said building;
c. attaching to said landings a plurality of spaced-apart auxiliary guide members extending vertically to substantially the building height with each pair of adjacent said guide members defining with said attached landing the lateral and innermost limits, respectively, of a vertically extending channel through which housing units are to be hoisted;



d. providing additional auxiliary guide members extending vertically to substantially the building height and connecting with said first mentioned auxiliary guide members to likewise define lateral limits to said vertically extending channels as well as defining the outermost limits thereof whereby, said landings define a plurality of bays in each channel at the innermost end thereof and the outermost limits of said channels are void of any lateral connecting structure between adjacent pairs of said additional auxiliary guide members;
e. constructing a co-planar platform extending from the top of said wall of said well-defining structure to which said landings are attached, with said platform overlying in a co-extensive manner said auxiliary guide members and all of said adjacent vertical channels;
f. providing a winch mounted on rails atop said platform;
g. moving said winch on said platform rails above the top of a selected one of said channels;
h. forming openings in said platform to permit the lowering of cables from said winch into said selected channel;
i. moving a pre-assembled housing unit longitudinally into said selected channel through the open portion thereof between said additional auxiliary guide members at substantially ground level until said housing unit is fully wihtin the confines of said channel and beneath said platform and winch;
j. connecting said lowered cables to said housing unit within the bottom of said selected channel;
k. vertically hoisting said housing unit with said winch through said channel to the uppermost available one of said bays adjacent a landing;
l. securing cross beams to said guide members laterally of said selected channel beneath said hoisted housing unit to support said housing unit;
m. securing said housing unit to said cross beams;
n. disconnecting said cables from said housing unit and repeating this step and steps (i) through (m) until housing units have been installed within all bays within said selected channel;
o. moving said winch on said platform rails above the top of another selected one of said channels;
p. repeating steps (h) through (n); and
q. following installation of housing units within all said channels raising said cables and removing said winch from said platform.

3,863,419

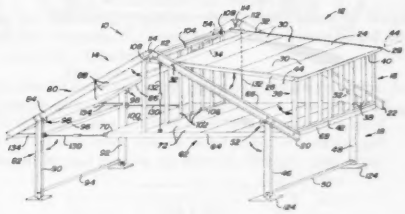
METHOD OF CONSTRUCTING A FOLDABLE BUILDING

John H. Hendrich, 5 W. 10th St., Erie, Pa. 16501

Continuation-in-part of Ser. No. 178,942, Sept. 9, 1971, abandoned. This application Feb. 15, 1973, Ser. No. 332,677

Int. Cl. E04b *1/344, 1/35*

U.S. Cl. 52—747 **11 Claims**



1. A method of constructing a building comprising the steps of:
a. providing a first module including a side member having first and second end portions and a roof member having first and second end portions with the second end portion of the roof member being connected to the second end portion of the side member for pivotal movement about a first axis in a manner which permits them to be folded into a configuration wherein they are in side-by-side generally parallel relationship;
b. providing a first base;
c. providing a second base spaced from said first base;
d. positioning said first module in its folded configuration to lie generally horizontally with said side member subjacent said roof member and the first end portion of the roof member extending toward the second base;
e. pivotally connecting the first end portion of the side member to said first base for pivotal movement about a stationary, non-translatory second axis parallel to said first axis;
f. lifting said first module to pivot it relative to said second axis to produce arcuate translatory movement of said first axis and cause said side member to assume a generally vertical position with said roof member extending at an angle therefrom;
g. and, providing a support member and connecting said support member between the first end portion of said roof member and said second base to maintain said side member in the generally vertical position.

3,863,420

APPARATUS FOR INSTALLING BRICKS IN A KILN

Jack S. Peiffer; Donald J. Thelen, and Jimmie L. Moore, all of Houston, Tex., assignors to J. T. Thorpe Company

Filed Feb. 13, 1974, Ser. No. 442,088

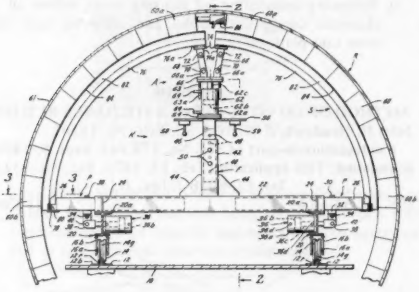
Int. Cl. E04g *21/22*

U.S. Cl. 52—749 **15 Claims**

1. A kiln apparatus for lining an interior face of a shell of a rotary kiln with liner bricks comprising:
a. a pair of arcuate brick-supporting shoes each having a lower end and an upper end, adapted to be located within the shell of the rotary kiln;

b. yieldable compensating means overlying said shoes and mounted therewith;

c. positioning means for moving the lower ends of said shoes laterally into engagement with kiln bricks when disposed in the shell; and



d. actuating means for urging the upper ends of said shoes inwardly and outwardly after said positioning means has been moved to engagement with the kiln bricks for causing bricks positioned between said shoes and the shell to move into engagement with the interior face of the shell.

3,863,421

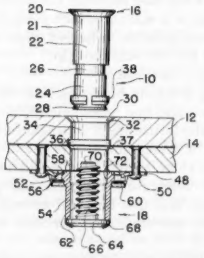
SELF-RETAINED PANEL FASTENER ASSEMBLY

William J. Busch, Fountain Valley, and Ervin J. Dey, Santa Fe Springs, both of Calif., assignors to Standard Pressed Steel Co., Jenkintown, Pa.

Filed May 21, 1973, Ser. No. 362,174

Int. Cl. F16b *7/18*

U.S. Cl. 52—758 F **14 Claims**



1. A self-retained panel fastener comprising a head and shank extending therefrom, said shank being formed with a thread configuration and being adapted to extend through aligned openings in a stack of workpieces, said shank including a first portion adjacent said head and a second portion spaced from said first portion by a groove, said second portion having a diameter smaller than the diameter of said first portion, and a compressible retaining ring on said shank portion, said ring having an inner-diameter slightly larger than that of said second shank portion and smaller than that of said first shank portion whereby said ring is slidable along said second shank portion to seat on said groove, said shank including radially projecting means adjacent the free end thereof for retaining said ring on said shank, said ring further having an outer-diameter larger than that of said first shank portion when the ring is uncompressed, said ring being compressible in said groove so that said outer-diameter is substantially equal to that of said first shank portion whereby said shank can be inserted through said openings in said workpieces when said ring is compressed, said ring further having aligning means formed thereon for aligning the workpieces during insertion of said shank through said openings in said workpieces.

3,863,422

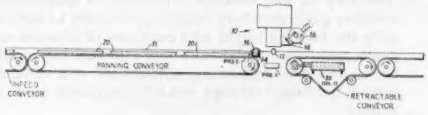
BAKING PAN REGISTRATION CONTROL SYSTEM

Dale R. Wagner, Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,568

Int. Cl. B65b *57/08, 57/16, 57/20*

U.S. Cl. 53—55 **9 Claims**



1. In a baking pan registration control system for controlling the positioning and movement of baking pans to deposit dough pieces at one or more predetermined locations on each pan, the combination comprising

dough piece dispensing means for repetitively dispensing dough pieces which are deposited in a given pattern on each dispensing action,

a pan conveyor for conveying baking pans to receive dispensed dough pieces,

conveyor motor means for moving said conveyor at selectable speeds which are functions of the dispensing rate of the dough piece dispensing means,

means for sensing the arrival of a designated portion of a pan at a predetermined location at or adjacent the dispensing means,

means for establishing a programmed deposition of dough pieces,

means operating in response to said sensing means and to said dispensing means for positioning and moving a pan to receive dough pieces at said predetermined locations in accordance with said programmed deposition of dough pieces,

means for monitoring the deposition of dough pieces and for determining the conclusion of the programmed deposition, and

means operable in response to said last named means and at the conclusion of the programmed deposition for conditioning said system to respond according to the programmed deposition upon sensing a subsequently appearing designated pan portion at said predetermined location.

3,863,423

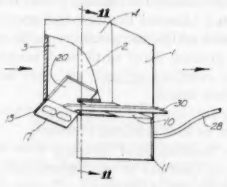
METHOD FOR CLOSING AND SEALING CARTON HAVING INTEGRAL CARRYING HANDLE

Frank D. Bergstein, Cincinnati, and Robert W. Nerenberg, Middletown, both of Ohio, assignors to The Interstate Folding Box Company, Middletown, Ohio

Filed Mar. 29, 1974, Ser. No. 455,972

Int. Cl. B65b *43/42, 7/20*

U.S. Cl. 53—29 **9 Claims**



1. In a method for closing and sealing a carton having a tubular body and end closures at its opposite ends, one of said end closures comprising end closure flaps hingedly connected to the end edges of three of the carton body walls and a panel

hingedly connected to the end edge of the remaining carton body wall, the panel being cut and scored and folded upon itself to define a double thickness carrying handle immediately adjacent the remaining carton body wall and a closure flap portion extending in prolongation of the reversely folded portion of the handle, the steps of positioning the tubular body of the carton in vertically disposed position with the closure flaps and carrying handle extending in prolongation of the carton body walls and with the closure flap portion of the handle forming panel extending inwardly within the carton body, advancing the carton in a path of travel and, as the carton advances, sequentially infolding the leading closure flaps and outfolding the carrying handle, the outfolding of the carrying handle acting to infold the attached closure flap portion into essentially planar relationship with the leading closure flap, and thereafter infolding and adhesively securing the remaining end closure flaps to the leading closure flap and the closure flap portion of the handle forming panel.

3,863,424

BLOWING AND FILLING MACHINE FOR THE CONTINUOUS PRODUCTION OF FILLED AND SEALED CONTAINERS, PARTICULARLY INFUSION BOTTLES

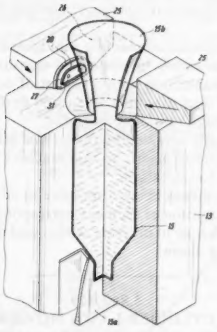
Wilhelm Naumann, Ettlingen, Baden, Germany, assignor to PMD Entwicklungswerk fur Kunststoff-Maschinen GmbH & Co., K.G., Ettlingern, Germany

Filed May 23, 1973, Ser. No. 363,129

Claims priority, application Germany, May 25, 1972, 2225311

Int. Cl. B65b *3/02, 47/08*

U.S. Cl. 53—192 **2 Claims**



1. An apparatus for the production of filled infusion bottles comprising:

a suspension station adapted to extrude at least one tube of synthetic-resin material;

a blowing, filling and sealing station spaced from said extrusion station and provided with a blowing mandrel receivable in a tube extruded at said extrusion station for blowing same and for filling the blown tube;

a blowing mold shiftable between said stations for receiving said tube and retaining same during the blowing and filling thereof, said blowing mold comprising a pair of separable mold parts defining at least one cavity having the configuration of an infusion bottle, said cavity being formed with a downwardly convex upward wall portion surrounding an opening adapted to receive said mandrel and conforming to the concave bottom of an infusion bottle adapted to be formed in said cavity, said mold parts being further provided with cutting and sealing edges at a bottom portion for sealing the top of an infusion bottle adapted to be formed in the mold cavity;

a pair of clamping members engageable with a portion of said tube projecting from said opening and formed with first sealing edges conforming to the concavity of the bottom of said bottle for sealing said bottom, and annular sealing and cutting edges for defining a flat eye extending from said bottom and formed with a hole enabling the hanging of said bottle from the synthetic-resin material extending through said opening;

means for displacing said members into and out of engagement with the synthetic-resin material extending through said opening; and

means for removing the filled bottles from said mold and transporting them away.

3,863,425

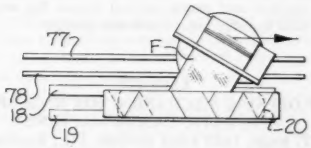
APPARATUS FOR WRAPPING ELONGATE CYLINDRICAL OBJECTS

John M. Edwards, Charlotte, N.C., and James D. Wright, Berkley Heights, N.J., assignors to John Edwards and Associates, Inc., Charlotte, N.C.

Filed May 14, 1973, Ser. No. 360,156

Int. Cl. B65b *11/04*

U.S. Cl. 53—211 **13 Claims**



1. An apparatus for covering elongate cylindrical objects with elongate sheet material having a width less than the length of said object, said apparatus comprising

a. a pair of rolls supported for rotation in spaced apart position with the distance therebetween being less than the diameter of said object so that said object may be supported between and on said rolls,

b. means for driving at least one of said rolls to impart rotation to said object while it is supported on said rolls,

c. carriage means supporting a supply roll of said elongate sheet material adjacent one side of said pair of rolls,

d. drive means for moving said carriage along a path of travel parallel to said pair of rolls, and

e. control means for varying the angular position of said carriage during movement of said carriage by said drive means to thereby change the angular relationship between the rotational axis of said supply roll and the rotational axis of said object and to form convolute windings of the sheet material at opposite ends of said object with overlapping spiral windings in the medial portion of said object.

3,863,426

DISC TRANSFER DEVICES TO PETRI DISHES

Patrice Marie Denis Paul Courvalin, Paris, France, assignor to Agence Nationale de Valorisation de la Recherche, Neuilly-sur-Seine, (Hauts-de-Seine), France

Filed May 25, 1973, Ser. No. 364,064

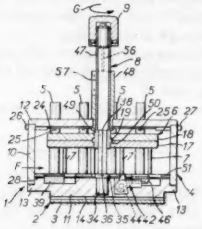
Claims priority, application France, May 26, 1972, 72.018905

Int. Cl. B65b *5/06, 67/02*

U.S. Cl. 53—237 **15 Claims**

1. A transfer device for depositing discs on a receiving surface, comprising a casing having a bottom particularly adapted to face the receiving surface, a plurality of tubes mounted in the casing for storing stacks of discs, an ejection passageway in said casing laterally adjacent each stack, trans-

fer means for transferring the disc at the bottom of each stack laterally to an ejection position in alignment with a corresponding one of said ejection passageways, a plurality of plungers arranged in alignment with said ejection passageways



for sliding movement perpendicular to the bottom of the casing towards the receiving surface for driving the discs from their ejection position through said passageways onto the receiving surface and single control means for sequentially actuating said transfer means and said plunger.

3,863,427

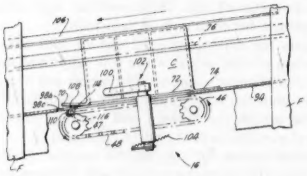
FLAP OPENING MECHANISM FOR HIGH SPEED AUTOMATIC CASING MACHINE

Anthony T. Rossi, 1800 Point Pleasant Ave., Bradenton, Fla. 33505

Division of Ser. No. 183,477, Sept. 24, 1971, Pat. No. 3,805,484. This application Feb. 11, 1974, Ser. No. 441,040

Int. Cl. B65b *43/39*

U.S. Cl. 53—382 **2 Claims**



1. For use in an automatic carton packing operation wherein a plurality of empty cartons are conveyed past a flap opening station, said cartons having at least the bottom leading flaps thereof in the closed position, a flap opening mechanism at said flap opening station comprising support means adapted to convey said carton at its bottom and having an opening therein, carton conveying means adapted to convey said carton along said support means in a given direction and flap engaging means comprising: a member adapted to engage said leading flap through said opening in said support means; an endless conveyor means moving said member in an endless path under said opening in said support, said member being articulately mounted on said endless conveying means, said member being effective to engage said leading flap and to pivot same outwardly as said carton passes said flap opening station, and actuating means operably connected to said member for moving said member upwardly through said opening to raise said leading flap above the level of said support means before said front flap reaches the end of said opening.

3,863,428

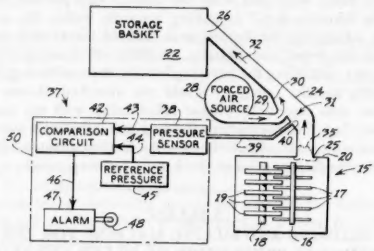
BLOCKAGE MONITOR FOR A COTTON PICKING MACHINE

Robert L. Baxter, 6501 Harding Rd. Apt. A-9, Nashville, Tenn. 37205

Filed Nov. 14, 1973, Ser. No. 415,511

Int. Cl. A01d *45/18*

U.S. Cl. 56—10.2 **4 Claims**



1. In a cotton picking machine having a picker head for picking cotton from a cotton plant, a storage receptacle for receiving picked cotton, a pneumatic duct assembly including an enlarged housing for said picker head and an elongated tubular duct of smaller cross-section than said housing, said tubular duct having an open inlet end in fluid communication with said housing and an open outlet end in fluid communication with said receptacle, and forced draft means for moving air through said duct assembly toward said receptacle with sufficient pressure to draw picked cotton from said picker head through said duct assembly to said receptacle, a blockage monitor system comprising:

a. a pressure-electrical transducer element mounted on said machine,

b. a tubular conduit connecting said transducer element to said duct assembly to place said transducer element in fluid communication with a region of negative pressure within said duct assembly when said draft means is moving air through said duct assembly,

c. an electrically actuated alarm on said machine,

d. electrical circuit means on said machine connecting said transducer to said alarm,

e. said circuit means being responsive to an electrical signal from said transducer element corresponding to a predetermined change in pressure within said duct assembly to actuate said alarm.

3,863,429

CYLINDER LAWN MOWER

Bernard Joseph Beusink, Oerle, and Barteld Niezen, Goningen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 14, 1971, Ser. No. 133,813

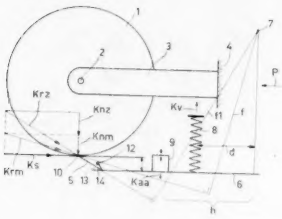
Claims priority, application Netherlands, Apr. 17, 1970, 7005530

Int. Cl. A01d *55/20*

U.S. Cl. 56—249 **9 Claims**

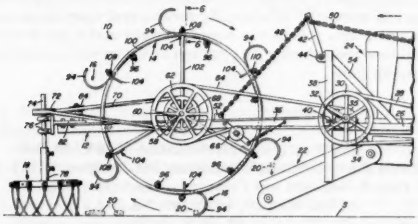
1. A lawn mower of the cutter-cylinder type comprising a wheeled frame, a subframe attached to said frame, a cutter cylinder rotatably mounted on a spindle carried on said subframe, at least one cylinder knife carried by said cutter cylinder, a ledger blade support pivotally attached to said frame, a ledger blade carried by said ledger blade support and arranged for cooperative engagement with said cylinder knives, helical spring means secured at one end thereof to said frame and connected at its other end to said ledger blade support for urging said ledger blade and said cylinder together so that the blade and knives are resiliently held towards each other, an adjustable abutment secured to the frame for limiting the travel of said ledger blade support so as to produce a cutting gap between the ledger blade and the cutter cylinder, a pivot

journalled in the frame and extending parallel to said cutter cylinder spindle, said knife and blade which are resiliently held towards each other being pivotable about said pivot into engagement with said abutment, whereby the cutting force which is produced during a cutting operation results in a cutting moment acting about said pivot with respect to each said knife, said cutting moment acting opposite to the spring moment caused by said spring acting about said pivot with respect to each said knife, so that upon an excessive cutting



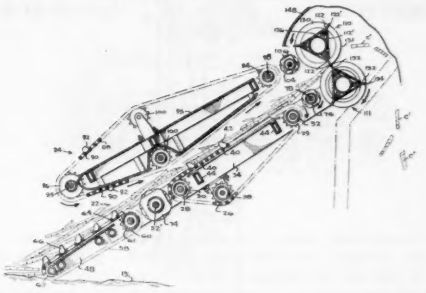
force during a cutting operation said cutting moment will exceed the spring moment and cause the cylinder knife and ledger blade to separate, said ledger blade support being arranged so as to be pivotable about said pivot journalled in the frame, the axis of said pivot being located behind the cylinder spindle with respect to the direction of travel of the mower and being located an equal distance from the line tangent to said cylinder at the point of contact between said cylinder and said ledger blade and the line passing through said contact point and the center of said cylinder spindle.

3,863,430
CORN PICK-UP DEVICE
James H. Jennings, Rt. 1, Box 84, Muleshoe, Tex. 79347
Filed Apr. 25, 1973, Ser. No. 354,382
Int. Cl. A01d *87/04*
U.S. Cl. 56—345 **7 Claims**



3. In a gathering machine having a frame, a support rotatably mounted on the frame, and a means for picking mounted on the support for rotation therewith, the improvement wherein the picking means includes a resilient element having a hook forming a flexible cup arranged for picking-up an article lying on a surface which the frame is traversing, the picking means further including a plurality of resilient elements, and means for maintaining a predetermined spacing of these resilient elements, the means for spacing including a plate mounted on the support and provided with a plurality of slots arranged for receiving the resilient elements.

3,863,431
APPARATUS FOR HARVESTING AND CLEANING WINDROWED CANE
Larry G. Fowler, Belle Glade, Fla., assignor to Sugar Cane Growers Cooperative of Florida, Belle Glade, Fla.
Continuation-in-part of Ser. No. 248,970, May 1, 1972, Pat. No. 3,828,536. This application May 9, 1973, Ser. No. 358,695
Int. Cl. A01d *49/00*
U.S. Cl. 56—502 **24 Claims**



1. Field harvesting means for gathering freshly cut windrowed cane comprising a motor driven vehicle, cane pickup and conveying means mounted on and extending forwardly from said vehicle for engaging windrowed cane extending in generally parallel relation to the direction of movement of said vehicle and lifting the cane of the windrow upwardly from the ground for rearward conveyance, cane segmentizer means positioned on said vehicle to receive cane from said pickup and conveying means, a cleaning chamber mounted on said vehicle in a position to receive cane segments discharged from said cane segmentizer means to fall downwardly through said cleaning chamber, an outfeed conveyor means mounted on the vehicle and having a lower end in said cleaning chamber to receive said cane segments falling through said cleaning chamber, said outfeed conveyor extending transversely upwardly from said cleaning chamber and having a discharge end spaced to one side of said vehicle, means mounted on said vehicle for providing an air blast in said cleaning chamber across said cane segments falling through said cleaning chamber onto said outfeed conveyor for removing trash and leaf particles from said cane segments and blower means mounted adjacent the outer end of said outfeed conveyor for creating an air flow across the path of travel of cane segments falling from the discharge end of said outfeed conveyor.

3,863,432
APPARATUS FOR TAKING OUT CAKES FROM CENTRIFUGAL SPINNING UNITS
Akihiro Isobe; Takeshi Iwasaki, and Shigeo Katsuyama, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Nov. 16, 1973, Ser. No. 416,509
Claims priority, application Japan, Nov. 18, 1972, 47-115845
Int. Cl. D01h *9/06, 1/08, 7/74*
U.S. Cl. 57—52 **5 Claims**

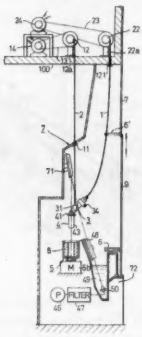
1. A cake removal unit in a centrifugal spinning set, comprising in combination:

A. first and second belts horizontally separated from one another and each respectively mounted at one end on first and second powered drum means; each of said first and second belts projecting downward through separate slit guides each disposed respectively below said first and second powered drum means;

B. an operating bar disposed below said slit guides and having pivotally suspended at one end thereof inflatable resil-

ient bag-type gripper means for removing a cake from a spinning pot disposed below said gripper means;

C. said operating bar having the other end of said first belt pivotally attached at an intermediate point between its ends and having the other end of said second belt at-



tached at the end thereof remote from said gripper means; and

D. said gripper means being further adapted to be maintained in a position of vertical alignment with the axis of said spinning pot immediately prior to beginning removal of a cake from said pot.

3,863,433

BALLOON CONTROL RING

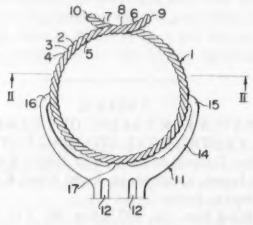
Hiroyuki Kanai, No. 3-15 Matsunouchi-cho, Ashiya, Japan

Filed Aug. 29, 1972, Ser. No. 284,492

Claims priority, application Japan, Sept. 2, 1971, 46-67756; Oct. 7, 1971, 46-79029; May 16, 1972, 47-48305

Int. Cl. D01h *13/04*; **D02g** *1/08*

U.S. Cl. 57—106 **2 Claims**



1. A balloon control ring through which a yarn is to pass having a ribbed inner surface over which the yarn rubs as it revolves and advances through the ring, the ribs on the inner surface being generally parallel to one another and extending at an angle of between 10° and 50° to the circular line at which the central plane in which the ring lies intersects the said inner surface, the arrangement being such that as a yarn revolves and passes over each successive rib, it engages each rib as or before it leaves the preceding rib, said ring being fixed to a supporting means through which it is fixed to the frame of a machine.

3,863,434

FALSE TWISTING OF YARN

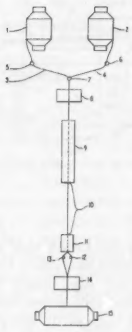
Werner Doschko, 6901 Nussloch am Leaimbach 16, and Heinz Gilch, 6908 Wiesloch in der Bohn 19, both of Germany

Filed Oct. 16, 1972, Ser. No. 274,008

Claims priority, application Great Britain, July 21, 1971, 34185/71

Int. Cl. D02g *1/02*

U.S. Cl. 57—157 TS **6 Claims**



1. A process for false twist texturing a synthetic multifilament composite yarn comprising forwarding a yarn to be textured from feed means sequentially through a heated zone, a cooling zone, a false twisting zone and a yarn separation zone to a take up zone, friction twisting said yarn in said false twisting zone and passing said twist in said yarn through said cooling zone into said heating zone wherein said twist is heat set, cooled and untwisted as it is forwarded through said false twisting zone to thereby heat set the imposed twist and subsequently untwist to substantially remove real twist, separating said yarn into at least two plies to thereby arrest any residual real twist recombining the plies and taking up said yarn in said take-up zone.

3,863,435

METHOD FOR RESTRINGING A THREADLINE

Melvin Harry Johnson, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 20, 1973, Ser. No. 343,172

Int. Cl. B65h *69/06*

U.S. Cl. 57—159 **12 Claims**

1. A method for restringing an unstrung threadline in a high-speed apparatus processing multiple running threadlines moving under tension said method comprising:

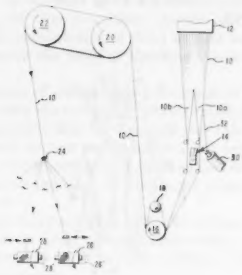
a. retrieving the unstrung threadline while moving it through a yarn handling device;

b. diverting a running threadline through a yarn passage of the jet splicer portion of a splicer-cutter apparatus;

c. diverting the retrieved moving unstrung threadline through said yarn passage while maintaining tension in said unstrung threadline;

d. interlacing the moving unstrung threadline with the running threadline by directing air under pressure into said yarn passage in a plane perpendicular to the running

threadlines to form a splice while practically simultaneously cutting the unstrung threadline upon its exit from



the jet splicer whereby the unstrung threadline is carried by the running threadline.

3,863,436

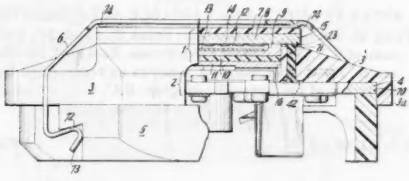
SOLID STATE QUARTZ WATCH

Jack Schwarzschild, Stamford, Conn., and Raymond Robert Boxberger, So. Nyack, N.Y., assignors to Timex Corporation, Waterbury, Conn.

Filed Apr. 18, 1974, Ser. No. 462,151

Int. Cl. G04b *19/30, 37/14;* **H02g** *3/08*

U.S. Cl. 58—50 R **9 Claims**



1. A solid state watch module comprising:

Electrooptical display means having electrically energizable characters visible on a viewing surface and also having a first plurality of electrical contact terminals connected to said characters.

a substrate having printed circuit leads on at least one side thereof connected to a second plurality of electrical contact terminals, said substrate having an integrated circuit mounted thereon also connected to said printed circuit leads and adapted to provide driving signals to said display characters to give a time indication,

an intermediate connector member having first means locating the display means on one side thereof and second means locating the substrate on the other side thereof and including electrically conductive members making contact between said first and second plurality of contact terminals, and

spring clip means adapted to hold said display means, connector member and substrate together in compression and to maintain said electrically conductive members in contact with the first and second terminals.

3,863,437

ELECTROMAGNETIC BUZZER FOR A WATCH WITH TONGUE ADJUSTMENT MEANS

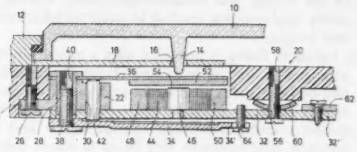
Mandred Hans Barth, Calmbach; Adolf Sedlak, Pforzheim, and Walter E. Sodler, Buchenbronn, all of Germany, assignors to Timex Corporation, Waterbury, Conn.

Filed June 17, 1974, Ser. No. 479,713

Claims priority, application Germany, July 5, 1973, 2334153

Int. Cl. G04c *21/34;* **G04b** *23/12*

U.S. Cl. 58—57.5 **15 Claims**



1. In an electromagnetic buzzer for a watch, said buzzer of the type having a membrane with associated projecting pin means, an electromagnet system, a support arm carrying the electromagnet system, one end of which support arm is fixed to the watch and the other movable end of which can be adjusted relative to said pin means, and a tongue clamped on one end and arranged to be excited to oscillate by the electromagnet system and strike said pin means, the improvement comprising:

first adjusting means on said movable end of the support arm opposite the electromagnet system for positioning said support arm relative to said pin means,

second adjusting means acting near the clamped end of the tongue for positioning the tongue relative to the electromagnet system, said second adjusting means acting through reducation means.

3,863,438

DEVICE FOR INSURING THE TIGHTNESS OF A TIMEPIECE CASING

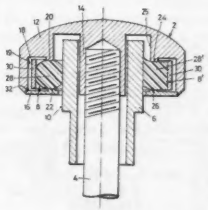
Rene Soguel, Rue de la Chapelle 10, Lee Hauts-Geneveys, Switzerland

Filed June 24, 1974, Ser. No. 482,568

Claims priority, application Switzerland, June 29, 1973, 9568/73

Int. Cl. G04b *37/08*

U.S. Cl. 58—90 B **22 Claims**



1. Device for insuring the tightness of a timepiece casing at the passage of a stem, containing:

a part which is fixed to the casing,

a part which is movable and attached to the stem

and a ring-shaped tightness fitting suited for undergoing an elastic deformation and fitted together with said parts around a cylindrical surface of one of them and in a ring-shaped bed of the other, in which it is held between ring-shaped surface sections located in this bed, wherein said tightness fitting has a profile the height of which in

radial direction of its ring shape is approximately at least equal to its width in axial direction of its ring shape,

said ring-shaped surface sections of one of the parts which grip the tightness fitting, are at least approximately axially formed opposite both sides of the fitting on which they exercise an axial gripping pressure substantially free from any radial component, said ring-shaped surface sections being defined on ring-shaped projections which stand out axially toward the fitting in order to only set up the axial gripping between two opposite ring-shaped grip-zones which are narrow with regard to said height of the profile of the fitting and beside which there remain no-grip-zones, said gripping tending to cause a radial extension of said height,

the tightness fitting is provided with a radial retention ring arranged around at least one elastically deformable fitting-body in order to restrain said radial expansion outwardly so as to make it act inwardly against the mentioned cylindrical surface around which said fitting is engaged, said retention ring being in direct contact with neither of said two parts,

the surfaces by which said fitting is held axially and the surface by which said fitting encloses said cylindrical surface having between them such a pressure and dimension relationship when a relative rotation occurs between the two said parts, said tightness fitting remains fixed in rotation with the cylindrical surface which it encloses.

3,863,439

MACROCYSTALLINE WATCH DIAL

Kazutomo Kasai, Shimosuwa-machi, and Shuzo Koizumi, Suwa, both of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Aug. 21, 1973, Ser. No. 390,290
Int. Cl. G04b *19/10*
U.S. Cl. 58—127 R **11 Claims**

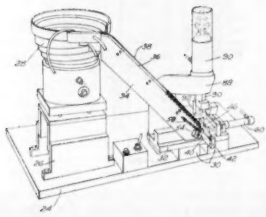
1. A watch dial having an outer face consisting essentially of metal crystals large enough to be visible to the unassisted eye, said metal selected from the group consisting of iron, tin, copper and alloys thereof.

3,863,440

SEMI-AUTOMATIC LINKING MACHINE

Morris Kortick, 124 Paine Ave., Cranston, R.I.

Filed Feb. 19, 1974, Ser. No. 443,805
Int. Cl. B21l *11/00*
U.S. Cl. 59—14 **17 Claims**



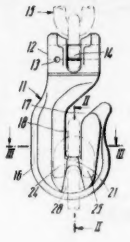
1. A linking machine comprising a base, a horizontal feed strip mounted front to rear on said base, means for feeding successive links in open position to said feed strip, means for moving each link forwardly on said strip, whereby an operator can hold objects to be linked on each side of said strip in position in the link, and means for bending the link into closed position to lock the objects to the link.

3,863,441

SHORTENING HOOK

Hans Kaufmann, 7084 Unterkochen, Glashutte, Germany

Filed June 21, 1973, Ser. No. 372,226
Claims priority, application Germany, June 23, 1972, 2231653
Int. Cl. F16g *17/00*
U.S. Cl. 59—93 **6 Claims**



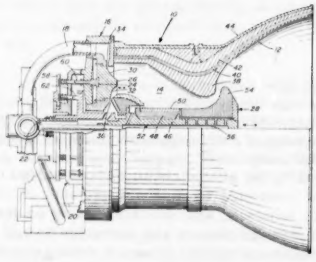
1. A shortening hook for round link chains having a plurality of connected links, said hook having an insertion slot formed by lateral supporting surfaces extending essentially parallel to each other to prevent tilting of an inserted chain link therein, said hook including a transverse yoke arranged in the region of the bottom of the hook slot and having projections which extend between the legs of the chain links following the chain link introduced into the shortening hook, the transverse yoke being developed as a supporting yoke and a centering trough providing a snug seat in the bottom of said slot for the inserted chain link and supporting the longitudinal leg of said link which faces the bottom of the insertion slot over practically its entire length.

3,863,442

ANNULAR SHEET AND VARIABLE AREA INJECTION

Craig M. Schmidt, Williamsville; Frank D. Bond, Jr., Buffalo, both of N.Y., and Ronald F. McKenna, Rockford, Ill., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 24, 1970, Ser. No. 24,901
Int. Cl. F02k *9/02*
U.S. Cl. 60—258 **4 Claims**



1. An injector assembly for throttling a bipropellant rocket engine having a thrust chamber comprising:

an annular deflector plate projecting into the head of the thrust chamber and movable in an axial direction to vary the propellant flow;

said deflector plate having inner and outer annular concave deflector surfaces which propellants flow over and film-cool;

radially spaced, circumferentially arranged inner and outer groups of propellant orifices formed in said injector assembly;

said inner group of orifices being arranged to inject first propellant streams to directly impinge said inner concave deflector surface and be flattened out into a fan effect whereby said first propellant streams are formed into continuous circumferential sheet as said streams spread out and reach the edge of said inner concave deflector surface;

said outer group of orifices being arranged to inject second propellant streams to directly impinge said outer concave deflector surface and be flattened out into a fan effect whereby said second propellant streams are formed into a continuous circumferential sheet as said streams spread out and reach the edge of said outer concave deflector surface; and

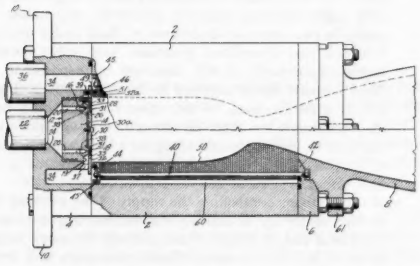
said inner and outer concave deflector surfaces being contoured so as to guide said circumferentially formed propellant sheets to impinge and combust downstream of said deflector plate.

3,863,443

HIGH PRESSURE ROCKET AND COOLING MEANS

John Chamberlain, North Palm Beach, Fla., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 25, 1963, Ser. No. 319,047
Int. Cl. F02k
U.S. Cl. 60—265 **29 Claims**



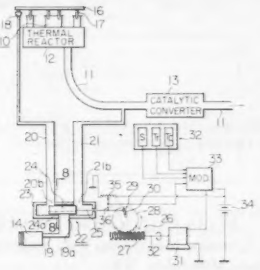
1. In an engine having a combustion chamber of circular cross-section and concentric about an axis and including a propellant injector head at the upstream end of the combustion chamber and an exhaust nozzle at the downstream end of the combustion chamber, and wherein the combustion chamber is made up of a plurality of coaxially, circumferentially extending, abutting, flat rings, the improvement wherein each of said rings includes an outer diameter surface and an inner diameter surface and a first face surface having a circumferentially extending groove therein and further having a second groove extending between and in communication with said outer diameter surface and said circumferentially extending groove, and said first face surface still further having a plurality of arcuate grooves extending between and in communication with said circumferentially extending groove and said inner diameter surface, each of said rings further having a second face surface having a plurality of arcuate grooves extending between said inner diameter surface and the region in axial alignment with said circumferentially extending groove.

3,863,444

AIR-POLLUTION PREVENTIVE ARRANGEMENT

Yasuo Nakajima, Yokosuka; Takeji Oguri, Yokohama, and Hiroshi Kuroda, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Division of Ser. No. 160,278, July 7, 1971, Pat. No. 3,826,089. This application Sept. 27, 1973, Ser. No. 388,800
Int. Cl. F01n *3/14*
U.S. Cl. 60—289 **2 Claims**



1. In an air pollution preventive arrangement, for use with an exhaust system having an exhaust passage through which exhaust gases emitted from an engine of a motor vehicle are discharged, comprising:

a thermal reactor mounted on said exhaust passage and located posterior to exhaust ports of said exhaust system for primary re-combusting unconsumed hydrocarbons and carbon monoxides contained in said exhaust gases;

at least one catalytic converter mounted on said exhaust passage and located posterior to said thermal reactor for secondarily re-combusting the exhaust gases passed from said thermal reactor;

an air injection unit including a pneumatic pump and an air passage divided into first and second branch passages, said first branch passage leading to said exhaust system anterior to said thermal reactor and said second branch passage opening into said exhaust passage anterior to said catalytic converter;

the improvement comprising a distributor interposed between said air passage and first and second branch passages, comprising:

a chamber into which said air passage is opened at its outlet port and from which said branch passages lead at their inlet ports; a piston slidably mounted in said chamber and having formed therein a groove longitudinally extending throughout the piston to provide communication between said outlet port and said inlet ports; a piston rod projecting from said piston and extending outwardly through said chamber, a gearing unit operatively connected to said piston rod for moving said piston through said piston rod in a longitudinal direction, and a reversible motor coupled with said gearing unit to drive the gearing unit selectively in either direction.

3,863,445

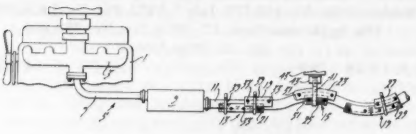
HEAT SHIELDS FOR EXHAUST SYSTEM

Robert A. Heath, Jackson, Mich., assignor to Tenneco Inc., Racine, Wis.

Filed Aug. 4, 1972, Ser. No. 277,870
Int. Cl. F01n *3/14*
U.S. Cl. 60—299 **7 Claims**

1. In a vehicle having an internal combustion engine with a catalytic exhaust system including a catalyst converter unit for reducing the quantity of unburned emissions in the exhaust gas, a pipe on the underside of the vehicle and connected to the converter to conduct exhaust gases away from the converter, an imperforate upper metal plate mounted adjacent

the pipe and spaced from and above it to serve as a heat shield protecting the underside of the vehicle body, and at least one



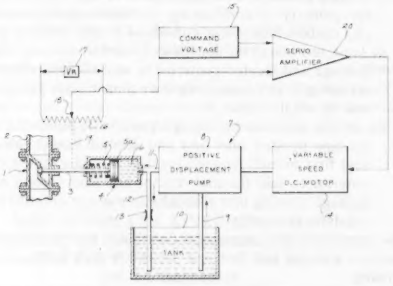
lower plate mounted adjacent the pipe and spaced from and below it, said lower plate being perforated.

3,863,446

FLUID POSITIONING APPARATUS

Harry L. Giwosky, Milwaukee, Wis., assignor to Jordan Controls, Inc., Milwaukee, Wis.

Filed July 16, 1973, Ser. No. 379,326
Int. Cl. F15b *9/03*
U.S. Cl. 60—388 **5 Claims**



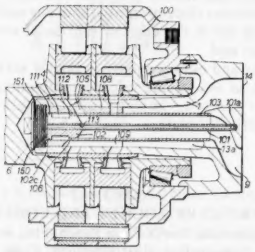
1. A positioning apparatus for accurately, mechanically positioning and holding a load in any one of a plurality of different load positions comprising a variable speed prime mover, a positive displacement pump coupled to and driven by said prime mover, a fluid responsive positioning device having a mechanical output for connection to a mechanical load and having a resilient return means, a fluid circuit means for connecting the positive displacement pump to the positioning device and a by-pass means including a restricted return means whereby the fluid pressure established is dependent on the speed of the prime mover to establish a position of the mechanical output against said resilient means, operating means connected to vary the speed of the prime mover and adjust the fluid pressure to said fluid responsive positioning device, and a servo control means connected to sense the position of the mechanical output and connected to control said operating means to said prime mover to adjust the speed of the prime mover in accordance with the sensed position and thereby the fluid pressure in said fluid responsive positioning device to variously position said mechanical output in any selected position between said limits and to hold said position with changes in the fluid circuit means.

3,863,447

HYDRAULIC MOTORS AND DRIVING SYSTEMS EMPLOYING SAME

Kenneth William Samuel Foster, Prestbury; Neil McIntosh Wallace, Stockport, and Duncan Kinloch Irons, Cheadle, all of England, assignors to Renold Limited, Wythenshawe, Manchester, England

Filed Dec. 8, 1972, Ser. No. 313,253
Claims priority, application Great Britain, Dec. 9, 1971, 57161/71
Int. Cl. F15b *7/04*
U.S. Cl. 60—425 **23 Claims**



1. An hydraulic motor having means for receiving an externally generated fluid pressure signal and having:

a rotor comprising at least two rows of pistons and cylinders; and

adjustable valve means for supplying fluid under pressure into the cylinders and for allowing the fluid to exhaust therefrom, thereby to drive the pistons and rotate the rotor, the valve means comprising only a single displaceable valve member which is selectively adjustable, linearly, in two opposite directions by fluid under pressure between two alternative positions, said valve member being displaceable in one direction in response to the fluid pressure signal supplied to the motor and acting on a first effective area of the valve member, and being displaceable in the other direction by the supply of working fluid to the motor and acting on a lesser effective area of the valve member which is oppositely directed to said first effective area of the valve member,

said valve means controlling the supply of the working fluid to the motor by selectively communicating a pressure fluid inlet and an exhaust fluid outlet of the motor respectively with a first number of said rows when in a first of said two alternative positions and with a second number of said rows which is greater than said first number of said rows when in the other of said two alternative positions, to provide for two different motor speeds for a given delivery of working fluid to the motor, the pressure fluid inlet and the exhaust fluid outlet being interchangeable to rotate the rotor in opposite directions.

3,863,448

PRESSURE COMPENSATED PUMP

Paul J. Purdy, Eldridge, Iowa, assignor to J. I. Case Limted, Racine, Wis.

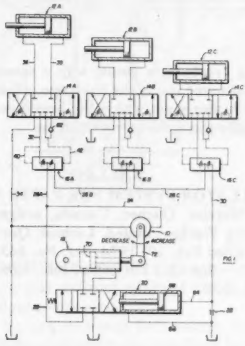
Filed July 11, 1973, Ser. No. 378,358
Int. Cl. F16h *39/46*
U.S. Cl. 60—422 **2 Claims**

1. In a hydraulic circuit having a variable displacement pump, a pump displacement controlling device, a plurality of hydraulic motors and a plurality of motor control valves, each hydraulic motor having an associated motor control valve for controlling the fluid flow to such hydraulic motor, the improved pump control system comprising:

a plurality of series-connected flow control valves each having its own input line and first and second output lines,

said input line of the upstream most flow control valve being connected to the output of the pump, said first output line of each of said flow control valves serving as an input line to an associated one of said motor control valves and being continuously connected across such flow control valve to the input line of such flow control valve, said second output line of each of said flow control valves being connected in series with the input line of the next downstream flow control valve;

feedback singal means interconnecting each of said motor control valves to its associated flow control valve and operable to sense the flow rate and flow demand through such motor control valve and to position the associated flow control valve to reduce flow from the input line to the second output line of such flow control valve when the flow demanded by such motor control valve exceeds the flow rate therethrough, and to increase the flow from



said input line to said second output line as the flow rate through such motor control valve catches up with the demand, thereby establishing a fluid supply priority among said flow control valves and their associated motor control valves which favors each upstream motor control valve relative to the next downstream motor control valve;

said second output line of the downstream-most of said series-connected flow control valves being connected to a flow demand-sensing device, said flow demand sensing device being connected to the pump displacement controlling device and being responsive to the flow rate in said second output line of said downstream-most flow control valve to signal the pump displacement controlling device to control pump displacement in inverse proportion to said flow rate, which flow rate is inversely proportional to the sum of the combined unsatisfied flow demand of all of said motor control valves

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3,863,449

HYDRAULIC MOTOR FLUID FLOW CIRCUITRY

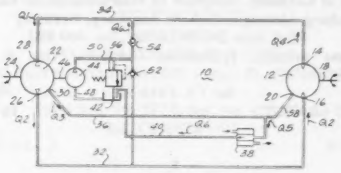
Hollis N. White, Jr., West La Fayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 27, 1973, Ser. No. 392,019
Int. Cl. F15b *21/04*
U.S. Cl. 60—456 **9 Claims**

1. A hydrostatic drive system comprising:

a hydraulic motor including a housing having first, second and third ports, an output shaft mounted for rotation, means in a primary fluid circuit disposed in said housing between said first and second ports and connected to said shaft for causing rotation of said shaft in response to fluid flow therethrough, a secondary fluid circuit disposed in said housing between said primary fluid circuit and said third port, and valve means in said secondary fluid circuit for bypassing a portion of the fluid received in said primary fluid circuit out of said housing through said third port;

a first pump including three ports and operable to discharge fluid at a first flow rate from a second of said ports, at a second flow rate from a third of said ports and receive fluid at said first and second flow rates combined at a first of said ports;



a heat exchanger connected to receive the fluid discharged from said third ports of said motor and said first pump for cooling and discharging the fluid;

a reservoir connected to receive the fluid discharged from said heat exchanger; and

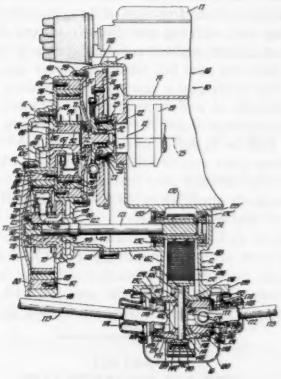
a second pump connected between said reservoir and said first pump for providing said pump with fluid equal to the fluid cooled in said heat exchanger.

3,863,450

HYDROSTATIC TRANSMISSION

Gilbert K. Hause, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 250,368, May 4, 1972, Pat. No. 3,805,641.
This application Nov. 8, 1973, Ser. No. 413,880
Int. Cl. F16h *39/46*
U.S. Cl. 60—487 **3 Claims**



1. In a hydrostatic transmission; a hydrostatic transmission housing having an intermediate wall with a pump chamber and motor passages on one side and pump passages coaxial with said pump chamber and a motor chamber coaxial with said motor passages, both on the opposite side of said wall; pump means mounted in said pump chamber having a coaxial pump shaft; motor means mounted in said motor chamber having a rotatably mounted coaxial driven shaft driven by said motor means in spaced parallel relation to said pump shaft; said pump chamber and said motor chamber being in partial overlapping relation with napes at the points where their perime-

ters intersect to reduce the space between said pump shaft and driven shaft; connecting passage means extending from said pump passages along said opposite side of said wall, across said wall at the napes between said pump and motor chambers and along said one side of said wall to said motor passages.

3,863,451

HEATER APPARATUS OF A HOT GAS EXTERNAL COMBUSTION PISTON ENGINE

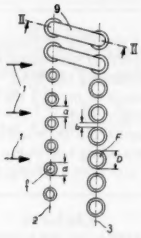
Peter Kuhlmann, Augsburg, and Franz Beschorner, Neusass, both of Germany, assignors to Maschinenfabrik-Augsburg-Nurnberg Aktiengesellschaft, Augsburg, Germany

Filed Sept. 26, 1973, Ser. No. 400,883

Claims priority, application Germany, Oct. 6, 1972, 2249117

Int. Cl. F01b *1/00*

U.S. Cl. 60—522 **16 Claims**



1. A hot gas piston engine of the external combustion type in which the working gas is heated, in passing to and fro between a plurality of regenerators and a plurality of work chambers through heating tubes, by a heating gas passing around the outside of said tubes, comprising:

two arrays of substantially straight and parallel heating tubes, one being located behind the other in the direction of flow of said heating gas and both arrays being disposed transverse to said direction of flow, including a first array leading said working gas directly to and from said hot work chambers without substantial change of direction of flow between said hot work chambers and the tubes of said first array and a second array leading said working gas directly to and from said regenerators without substantial change of direction of flow between said regenerators and the tubes of said second array;

connecting duct means for guiding said working gas back and forth between said first and second arrays with not substantially more than 180° of change of direction of flow of said working gas;

that one of said arrays of heating tubes which is upstream in the path of flow of heating gas (**2,13,18,26,28**) having a greater open cross-sectional area for the flow of heating gas than the other of said arrays (**3,15,22,23,27,29**) which is downstream in the path of flow of heating gas.

3,863,452

HOT-GAS ENGINE HEATER

George Albert Apolonia Asselman; Frits Reinink, and Joseph Wilhelmus Johannes Maria Van Der Leegte, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

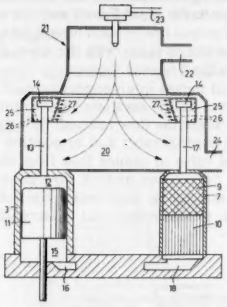
Filed Aug. 15, 1973, Ser. No. 388,601

Claims priority, application Netherlands, Sept. 22, 1972, 7212824

Int. Cl. F03g *7/06*

U.S. Cl. 60—524 **5 Claims**

1. In a hot-gas engine including a burner providing a flow of hot combustion gases, an expansion space for working gas, and a heater using thermal energy from said combustion gases to heat said working gas, the heater formed of a plurality of pipes, each pipe having a first part thereof situated in the flow path of said combustion gases, the improvement in combination therewith comprising a heat pipe also situated in the flow



path of said combustion gases, with a second part of each heater pipe situated inside the heat pipe, whereby said second parts of the heater pipes within the heat pipe are maintained at substantially the same temperature.

3,863,453

OSCILLATOR SYSTEM FOR PAPER MACHINE

Robert L. Mercier, Quebec, Canada, assignor to Dominion Engineering Works, Limited, Lachine, Quebec, Canada

Filed Feb. 19, 1974, Ser. No. 443,738

Int. Cl. F15b *7/00;* **F16h** *53/00*

U.S. Cl. 60—539 **2 Claims**

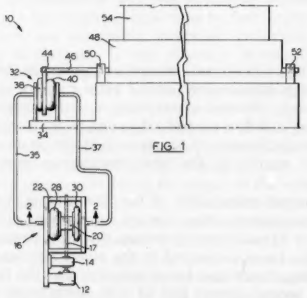


FIG. 1

1. An oscillating device to apply oscillation to a relatively moveable component of a paper machine, comprising a prime mover locatable remotely from the machine mechanically connected in driving relation with liquid pump means, said pump means being connected in liquid transfer relation with an oscillator means, said liquid pump means comprising a first compressible bag and a second compressible bag arranged in mutually opposed compressing relation within restraining frame means, said prime mover being arranged to provide alternate cyclic compression of said pump bags, said oscillator means comprising a third compressible bag and a fourth compressible bag arranged in mutually opposed compressing relation within restraining frame means, linkage means connecting said oscillator means to said machine component, said first bag being connected in liquid transfer relation solely with said third bag and said second bag being connected in liquid transfer relation solely with said fourth bag whereby in operation, on actuation of said prime mover to compress said first bag liquid is transferred therefrom to said third bag to cause expansion thereof, thereby moving said linkage means and said

machine component, said expansion of said third bag compressing said fourth bag to transfer liquid to said second bag in expanding relation therewith.

3,863,454

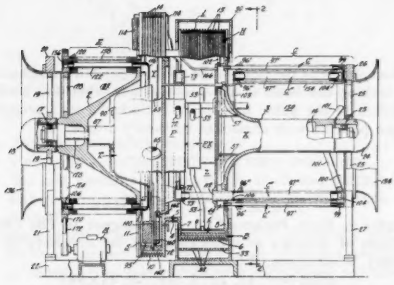
ROTARY HEAT ENGINE POWERED TWO FLUID COOLING AND HEATING APPARATUS

William A. Doerner, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 316,851, Jan. 2, 1973, , which is a continuation-in-part of Ser. No. 227,902, Feb. 22, 1972, abandoned. This application Aug. 8, 1973, Ser. No. 386,630

Int. Cl. F25b *3/00*; **F01k** *11/04*

U.S. Cl. 60—669 **31 Claims**



1. Rotary closed Rankine cycle engine powered cooling and heating apparatus utilizing different engine power fluid and refrigerant fluid comprising,

a cylindrical housing mounted for rotation about the axis thereof including an internal power fluid boiler,

means for heating the power fluid in said boiler to generate pressure power fluid vapor therein,

a power fluid expander in said housing including a coaxial driving member rotatably driven at a first predetermined speed by the power fluid vapor generated in the boiler,

means subdividing the interior of said rotatable housing to provide a power fluid compartment for receiving the power fluid from said expander and a refrigerant fluid compartment,

a compressor rotatably mounted coaxially in the housing and rotationally driven by the expander driving member for compressing refrigerant fluid from said refrigerant fluid compartment,

a condenser mounted coaxially adjacent one side of the housing and rotatable therewith comprising a plurality of axially spaced annular fins having heat exchange tubes extending longitudinally therethrough,

a predetermined number of said condenser heat exchange tubes being in communication with the power fluid compartment of the housing for receiving and condensing therein the power fluid vapor from said power fluid expander,

means for conducting compressed refrigerant fluid from the compressor to the remainder of said condenser heat exchange tubes for condensing said compressed refrigerant fluid therein,

refrigerant expander means in said housing for expanding the refrigerant fluid condensed in said condenser,

means for supplying condensed refrigerant fluid from said condenser to said refrigerant expander,

an evaporator mounted coaxially adjacent the other side of the housing from said condenser and rotatable therewith comprising a plurality of axially spaced annular fins having heat exchange tubes extending longitudinally therethrough and arranged to receive and vaporize therein refrigerant fluid from the refrigerant expander,

means for returning vaporized refrigerant from said evaporator to said refrigerant compartment of the housing,

and means operable to rotationally drive the housing, condenser and evaporator as a unit at a second predetermined speed substantially slower than said first predetermined speed and operable to cause a gaseous heat exchange fluid to be conveyed and accelerated by viscosity shear forces outwardly between the fins of the condenser and evaporator to the velocity providing optimum heat exchange between said gaseous fluid and the fluids in the heat exchange tubes of the condenser and evaporator.

3,863,455

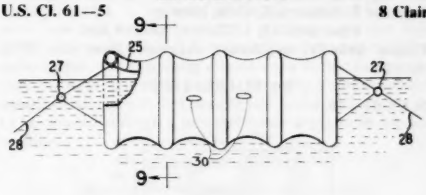
FLOATABLE BREAKWATER

Richard Buckminster Fuller, 200 Locust St., Philadelphia, Pa. 19106

Filed Dec. 10, 1973, Ser. No. 423,006

Int. Cl. E02b *3/04*

U.S. Cl. 61—5 **8 Claims**



1. A floatable breakwater comprising a flexible open-ended tubular envelope enclosing a plurality of axially spaced buoyant annular members therein, water from the outside of said envelope flowing in and out through the open ends of said envelope, said annular members being movable axially with respect to each other while supporting said envelope, and means connected to the end of said tubular envelope for anchoring each end of the envelope, the breakwater being positioned in the water with its longitudinal axis angularly disposed to the direction of the wave movement and floating at such a depth that the breakwater will be substantially filled with water through its open ends so as to be extendable and contractable axially by the relative movement of said annular members within said envelope when the breakwater is acted upon by waves.

3,863,456

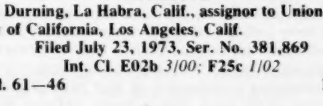
METHOD FOR CONSTRUCTING ICE ISLANDS IN COLD REGIONS

Paul J. Durning, La Habra, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed July 23, 1973, Ser. No. 381,869

Int. Cl. E02b *3/00*; **F25c** *1/02*

U.S. Cl. 61—46 **10 Claims**



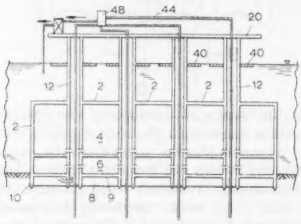
1. A method for constructing an artificial ice island in a water body covered by a floating sheet of ice, which comprises placing water on the surface of a selected portion of the floating sheet of ice, said selected portion being substantially less than the whole of said ice sheet and being surrounded by a remaining contiguous portion of said ice sheet, and said water being placed on said selected portion under ambient conditions such that the water is frozen on said selected portion to form an ice body having a central thickened portion and tapering in thickness from said central portion outwardly to the edge of said selected portion, said ice body having a mass

sufficiently large that the sheet of ice is deformed downwardly so as to define one continuous sheet of ice having three portions: (1) a grounded portion centrally located within said selected portion, which is grounded on the bottom underlying said water body; (2) an intermediate portion contiguous with said grounded portion and with an exterior portion of said ice sheet, said intermediate portion tapering in thickness from said grounded portion to said exterior portion; and (3) said exterior portion being undeformed and floating on said water body; and thereafter placing additional water on the upper surface of the ice island so that additional ice is formed to raise the elevation of the ice island above that of the surrounding floating ice.

3,863,457
SUBMARINE FOUNDATION AND OFFSHORE WORKING PLATFORM

Petter Sigvardt Hafskjold, Bekkestua, Norway, assignor to Ingenior F. Selmer A/S, Oslo, Norway

Filed June 13, 1973, Ser. No. 369,694
Claims priority, application Norway, June 13, 1972, 2083/72
Int. Cl. E02d *27/38*
U.S. Cl. 61—46.5 **7 Claims**



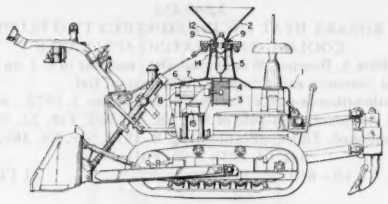
1. A submarine foundation and offshore working platform comprising a submersible integral concrete structure adapted to be situated on the sea bottom and having hollow spaces for confining ballast or other materials, said foundation including a plurality of adjacent, vertically arranged, prismatically or cylindrically shaped lower hollow bodies of concrete placed in contact with one another and integrally bonded together at their areas of contact, said bodies having closed bottom and top walls and being designed to rest on the sea bottom in underwater position, and above said hollow bodies a plurality of platform supporting columns each extending above seal level from the region of an interspace defined between a set of at least three hollow bodies which are mutually adjacently located and which are bonded each to only two other members of the set, each wall of each column constituting an upwardly extending continuation of that part of one of the hollow bodies, of the set of hollow bodies defining the interspace from which the column extends, which bounds the interspace.

3,863,458
DEVICE FOR SINKING AND RETRIEVING UNDERWATER HEAVY ARTICLE

Kunimitsu Ueno, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho

Filed Dec. 21, 1972, Ser. No. 317,706
Int. Cl. B63c *11/34*
U.S. Cl. 61—69 R **5 Claims**

1. A device for sinking and retrieving an underwater heavy article comprising a heavy article used under water, a take-up drum supported axially by said heavy article in connection to a prime mover controlled by the control command from a control desk on a ship for taking up a guide rope when the prime mover is normally rotated and for feeding out the guide rope when the prime mover is reversely rotated, a float removably mounted to the guide rope, a hook attached to the suspension wire rope wound on a winch drum on the ship and

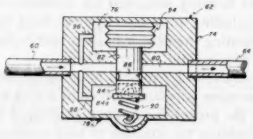


replaceable with the float of the guide rope, and a mechanism for locking the hook to the heavy article when the hook is attached to the guide rope to be introduced to a predetermined position with respect to the heavy article.

3,863,459
UNDERWATER HEAT SINK

Charles R. Rein, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 14, 1973, Ser. No. 415,907
Int. Cl. F17c *11/00*
U.S. Cl. 62—48 **4 Claims**



1. A cryogenic underwater breathing apparatus of the type wherein liquified gas is allowed to vaporize to augment a breathing gas mixture, said apparatus comprising:
- a first tank including insulated wall portions in part defining first and second adjacent chambers, said first tank also including heat exchange wall means between said first and second chambers and means for circulating breathing gas through said first chamber;
- a body of first liquified gas in said first chamber substantially at a predetermined low temperature;
- a body of second liquified gas in said second chamber also substantially at said predetermined low temperature;
- means defining a third chamber;
- adsorption material disposed in said third chamber and adapted to reduce pressure therein below a predetermined equilibrium pressure for said second liquified gas at said predetermined temperatures;
- a pressure responsive regulating valve;
- duct means connecting said pressure responsive regulating valve between said second and third chambers; and
- said pressure responsive regulating valve being responsive only to gas pressure in said second chamber and operative to vent gas from said second chamber to said third chamber, so as to maintain said equilibrium pressure and said predetermined low temperature.

3,863,460
DEVICE FOR THE STORAGE AND TRANSPORT OF LIQUIFIED GASES, LIQUIDS AND THE LIKE, IN PARTICULAR ON SHIPS

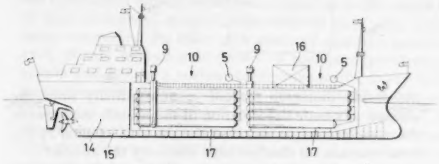
Fritz Straile, Bonn-bad Godesberg; Winfried Eming, Rheinbreitbach, and Wolfgang Kolb, Sinzig-Bodendorf, all of Germany, assignors to Liquid Gas Anlagen Union GmbH, Remagen-Rolandseck, Germany

Filed May 4, 1972, Ser. No. 252,141

Claims priority, application Germany, May 5, 1971, 2122162; Oct. 12, 1971, 2150693

Int. Cl. F17c *13/08*

U.S. Cl. 62—54 **37 Claims**



1. A storage assembly comprising:

a. a plurality of longitudinally extending containers,

b. the said containers being rigidly fixed and independent with respect to each other and being sealed at each end thereof,

c. an expansion vessel interconnected commonly and directly in parallel connection to each of all the containers to receive expansion media from each of the containers, and

d. means providing a single pumping station which is connected commonly and directly in parallel connection to each of all of the containers for discharging and filling each of the containers whereby the assembly is capable of handling a large capacity of liquified gases, liquids and the like,

e. said discharge and filling means including a vertically extending pipe and horizontally extending collector pipe interconnected to each of the containers so that the vertically extending pipe is in common communication with all of the containers,

f. the bottom of said vertically extending pipe being disposed at a level lower than the undermost edge of the container located at the bottom of the assembly.

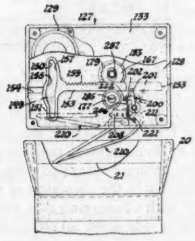
3,863,461
TRAY ICE MAKER WITH ICE LEVEL SENSING CONTROL

James A. Bright, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1973, Ser. No. 420,360

Int. Cl. F25c *5/18*

U.S. Cl. 62—137 **3 Claims**



1. An automatic icemaker comprising a frame, means for rotatably mounting a mold on said frame including a rotatable support connected to one end of said mold, means for filling said mold with water for freezing the water in said mold, a pinion gear connected to said rotatable support, a horizontally disposed rack bar having driving means on one end thereof, said rack having a tooth portion adapted to engage said pinion gear, a drive motor for said rack bar driving means for rotating said pinion gear and inverting said mold whereby the frozen ice pieces are harvested from said mold and discharged into a receptacle, and a thermostatic switch in the control circuit of said drive motor, wherein the improvement comprises an ice level sensing arm, including a holder pivotally received on said frame, for movement between a gravity biased lower position in said receptacle and an elevated position above said receptacle; said holder including a cam means and an integral switch actuator, said switch actuator operative for tripping an operator of an ice level switch, in said control circuit, to a first normally open contact when said sensing arm is in its gravity biased lower position, said cam means positioned in the path of said rack bar when said mold is in its upright position, whereby upon said thermostatic switch closing to its ice harvesting contact, in response to the formation of ice in said mold, and said ice level switch in its tripped position being series connected with said thermostatic switch to energize said drive motor, the energizing of said drive motor causing said rack bar to be moved to its mold inverting position whereby it engages said cam means causing said holder and sensing arm to be pivoted through a predetermined angle to its elevated position.

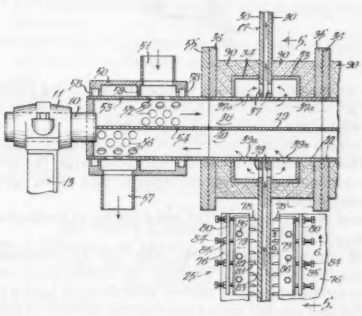
3,863,462
FLAKE ICE PRODUCING MACHINE

Allan J. Treuer, 2241 40th St. E., Seattle, Wash.

Filed June 29, 1973, Ser. No. 375,059

Int. Cl. F25c *7/12*

U.S. Cl. 62—345 **9 Claims**



1. A machine for the continuous production of a congealable liquid in frozen ice flake form, comprising:

a generally horizontal rotatable shaft,

a hollow disc mounted upon the shaft and having outer opposite flat freezing surfaces, said shaft rotating the disc and carrying said surfaces in a circular upright plane path, with the flat outer surfaces varying from the plane of rotation less than about 0.005 inches, means for continuously rotating the disc,

the disc having interior liquid coolant passages connected with the interior of the shaft for forced flow of coolant through the disc interior for removing heat from said flat freezing surfaces,

liquid applying means adjacent a portion of each of the flat surfaces for flowing a sheet of liquid over less than the whole of said surfaces, the remainder of said surfaces carrying ice in a sheet about a tenth inch thick until removed from the rotating surface, a liquid collection trough below said liquid applying means for catching excess liquid flowing over said surfaces,

said discs carrying ice frozen upon said surfaces beyond said liquid applying means and through an ice cooling and drying zone, said ice being supercooled in said cooling and drying zone,

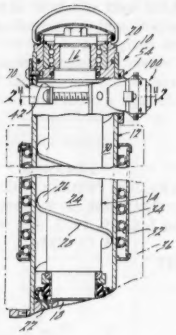
stationary ice removal tools closely adjacent each of said flat surfaces, in position for the disc to carry ice upon said surfaces into impinging relation with said tools, said tools having surfaces inclined to the arcuate path of ice carried into impinging relation with the tools to gradually force the ice in a direction away from each arcuate path to loosen same for gravity fall from the disc in flake form.

3,863,463

ICE MAKING APPARATUS

Robert P. Utter, and Vance L. Kohl, both of Albert Lea, Minn., assignors to King-Seeley Thermos Co., Ann Arbor, Mich.

Filed Aug. 16, 1973, Ser. No. 389,010
Int. Cl. F25c *1/14*
U.S. Cl. 62—354 **18 Claims**



1. An ice making apparatus comprising a housing member defining an ice forming chamber and providing an inner surface on which thin layers of ice are formed,

auger means rotatably mounted in the ice forming chamber and having a helical blade extending outwardly therefrom and terminating adjacent the inner surface of the tubular housing member,

means on the housing member and defining an ice discharge passage,

conduit means communicable with said last mentioned means for transferring ice from the apparatus to some predetermined location remote therefrom, at least a portion of said conduit means and said last mentioned means being movable relative to one another, and

means operable in response to relative movement between said conduit means and the said last mentioned means for opening and closing an electrical circuit communicating the apparatus with a source of electrical energy.

3,863,464

MINIATURE FLEXIBLE ROTATABLE SHAFT COUPLER

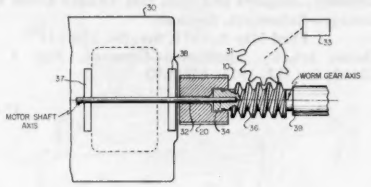
Robert B. Taggart, Mountain View, and Richard H. Barth, San Jose, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 15, 1973, Ser. No. 416,127
Int. Cl. F16d *3/17*
U.S. Cl. 64—11 R **6 Claims**

1. A coupling assembly for coupling two smooth rotatable shafts comprising:

a coupler having a substantially cylindrical shape with an outside diameter and an inside diameter that is accessible from either end thereof, said coupler being constructed of flexible and resilient material which elastically deforms to receive rotatable shafts at either end in uniform frictional engagement between the outside surface of the shafts and the inside surface of said inside diameter; and

a hollow coupler sleeve having a substantially cylindrical shape with an inside diameter accessible from either end thereof, said coupler sleeve being constructed of substantially inflexible material for receiving the coupler within



the inside diameter thereof to substantially limit the amount of elastic deformation of the outside diameter of the coupler and to increase the amount of diametrical force exerted on the rotatable shafts by the coupler;

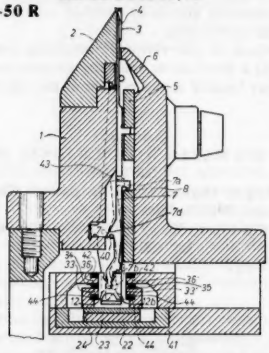
said uniform frictional engagement between the rotatable shafts and the coupler being increased by the increase in diametrical forces caused by the coupler sleeve.

3,863,465

ELECTRO-MAGNETIC SELECTION DEVICE FOR THE NEEDLES OF A KNITTING MACHINE

Aymon De Cerjat; Claude Cuche, both of Neuchatel, Switzerland; Roger Jeanneret, deceased, late of Couvet, Switzerland, by Marguerite Jeanneret, legal representative; Pierre-Bernard Jeanneret, legal representative, Couvet, Switzerland, and Heinrich H. Zimmerman, Couvet, Switzerland

Continuation-in-part of Ser. No. 10,138, Feb. 10, 1970, abandoned, which is a continuation-in-part of Ser. No. 823,536, May 6, 1969, abandoned. This application Apr. 28, 1972, Ser. No. 248,749
Int. Cl. D04b *15/78*
U.S. Cl. 66—50 R **9 Claims**



1. Electromagnetic selection device for the needles of a knitting machine, comprising jacks for raising the needles, cam means for moving the jacks upward when in selected position, a selector for each said jack movable laterally of the direction of travel of the needles to position said jack in or out of selected position, channel means guiding said selectors and comprising successively in the direction of movement of said selectors a portion with converging side walls, a throat and a portion with diverging side walls, an electromagnetic selection system at said throat of said channel means, said electromagnetic selection system comprising opposite pairs of pole pieces disposed at the side walls of said channel means for drawing said selectors selectively to one or the other side of said channel means, and a permanent magnet system in the portion of

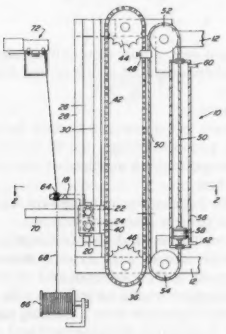
said channel means with diverging side walls for maintaining said selectors at the side of said channel means to which they have been drawn by said electromagnetic selection system, said permanent magnet system comprising a single permanent magnet disposed transversely of and beneath said channel means portion with diverging side walls, said permanent magnet being vertically magnetized and having an upper face of one polarity and a lower face of the opposite polarity, a pair of spaced superposed pole pieces of opposite polarity at each of the diverging side walls of said diverging portion of said channel means, and two soft iron yoke systems, one of said yoke systems being connected to one pole piece of one polarity of each of said pair of pole pieces of said permanent magnet system and having a portion contiguous to the upper face of said permanent magnet, the other of said yoke systems being connected the other pole piece of opposite polarity of each of said pair of pole pieces of said permanent magnet system and having a portion contiguous to the lower face of said permanent magnet, whereby the total flux of said single permanent magnet is distributed between the pairs of pole pieces at opposite sides of said portion of said channel means with diverging side walls according to the distribution of said selectors at one or the other side wall.

3,863,466

APPARATUS FOR GUIDING AND FEEDING FILAMENTARY MATERIAL

Robert A. Barone, Holland, Pa., assignor to Automated Textile Equipment Industries, Incorporated, Philadelphia, Pa.

Filed May 7, 1973, Ser. No. 357,992
Int. Cl. D04b *35/12*
U.S. Cl. 66—163 **11 Claims**



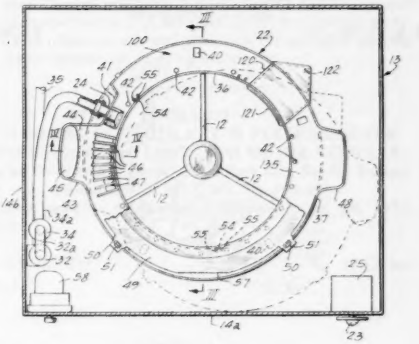
1. Apparatus for use with a machine for processing filamentary material comprising a tension trip mechanism having at least one finger pivotable from an operative position to an inoperative position in response to excess tension of filamentary material, a carriage guided for movement from an inoperative position remote from said trip mechanism to an operative position adjacent said trip mechanism, said carriage having a guide for filamentary material which is to be guided by said trip mechanism finger before extending to a processing machine, circuitry associated with said carriage and responsive to actuation of said trip mechanism finger to its inoperative position for causing said carriage to move upwardly from its inoperative position to its operative position and then return to its inoperative position, said carriage including means thereon for resetting said trip mechanism when the carriage is in its operative position by effecting pivotable movement of said finger to its operative position.

3,863,467

AUTOMATIC WASHING MACHINE AND OVERFLOW TUB RING THEREFOR

John W. Pielemeier, and Robert M. Weir, both of Saint Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed June 4, 1973, Ser. No. 366,501
Int. Cl. D06f *23/04, 37/00*
U.S. Cl. 68—18 F **14 Claims**



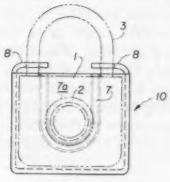
1. In an automatic washer having a cabinet,
a tub in said cabinet,
a clothes containing basket within said tub,
said tub having means defining a top opening and being movably suspended within said cabinet for receiving washing liquid,
a tub ring mounted on said tub and defining the opening thereinto,
said tub ring comprising an annular excursion limiting channel member extending around said top opening of said tub,
at least two opposed outwardly projecting excursion limiters extending from said channel member for limiting gyratory movement of said tub within said cabinet, and
wall means defining a drain opening through one of said excursion limiters.

3,863,468

SECURITY CASING FOR PADLOCK

Greta L. Bach, 65-69 162nd St., Flushing, N.Y. 11365

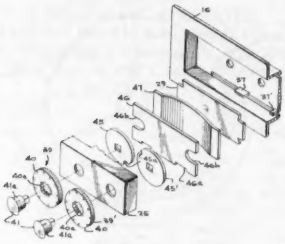
Filed Jan. 25, 1974, Ser. No. 436,458
Int. Cl. E05b *67/38*
U.S. Cl. 70—50 **4 Claims**



1. A disposable security casing for a padlock having a body including a top wall, a shackle including one end rotatably mounted on the top wall and a free end for lockingly engaging an opening in the top wall, and means on the body for locking and unlocking the free shackle end, the security casing comprising a bottom wall, two side walls and two end walls substantially conforming to the padlock body whereby the padlock body may be received in the security casing with the top wall of the body exposed, a pair of flexible tongues projecting from the end walls of the security casing, each tongue defining a hole for receiving a respective one of the shackle ends when

the padlock is received in the casing and the free shackle end lockingly engages the opening in the top wall, and an identification mark on one of the walls of the casing.

3,863,469
COMBINATION LOCK STRUCTURE
Wallace E. Atkinson, Petersburg, Va., assignor to Long Manufacturing Co., Inc., Petersburg, Va.
Filed June 7, 1973, Ser. No. 367,787
Int. Cl. E05b *65/48*
U.S. Cl. 70—74 **6 Claims**



1. A combination lock assembly adapted to be mounted on first and second wall portions of separable sections of a container adjacent a line of separation therebetween for securing the sections together, comprising a keeper to be affixed to the first wall portion, a latching unit to be mounted on said second wall portion including an elongated base member, a movable latch member slidably supported on said base member for rectilinear reciprocative movement along a path parallel to said line of separation between latching and release positions, said latch member including a housing having a catch projecting into selected alinement with said keeper for interlocking engagement therewith, a pair of rotatable dial wheels disposed at the front of said housing for manipulation to angular positions forming a selected combination, each of the respective dial wheels having hub portions rotatable therewith and extending into said housing including tumbler formations on the inner ends thereof rotatable with the hub portions, a fence plate guided within the housing for movement between release and locking positions and biased toward release position, said base member including a planar base panel paralleling said wall portions, said fence plate being movable along a fore-and-aft axis perpendicular to the plane of said base panel between a rearward locking position and a forward release position, said fence plate and base panel having recess and lug portions which interfit when said fence plate occupies said locking position to prevent movement of said latching unit from said latching position, said fence plate and the tumbler formations on said hub portions having means normally restraining said fence plate at locking position including coactive formations accommodating movement of the fence plate to release position when the dial wheels occupy said selected combination.

3,863,470
SLIDING DOOR LOCK
Jean F. O. Imer, 3806 Bent Rd., Falls Church, Va. 27042
Filed Sept. 7, 1973, Ser. No. 395,054
Int. Cl. E05b *65/08*
U.S. Cl. 70—100 **3 Claims**

1. A lock for use with a pair of overlapping closure members at least one of which is slideably mounted in an upper track including a side rail, said lock comprising:

a. faceplate means,

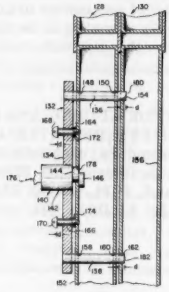
b. first bolt means secured to said faceplate means for passing through one of the closure members and at least partially through the other closure members to thereby prevent the closure members from sliding relative to each other,

c. lock means associated with said faceplace means for securing said faceplate means to one of the closure members and retaining said bolt means within the closure members, and

d. release means associated with said faceplate means for urging said faceplate means away from the closure to which it is adapted to be locked and said bolt means out of engagement with one of the closure members to thereby permit the closure members to slide relative to each other,

e. said release means including pin means slideably passing through said faceplate means and being adapted to be secured to the closure member to which said faceplate means is adapted to be locked,

f. said release means further including spring means positioned around said pin means.



2. In combination with a pair of relatively sliding overlapping closure members mounted in upper and lower tracks, a lock comprising:

a. faceplate means,

b. first bolt means being secured to said faceplate means and slideably passing through one of said closure members into an overlapping portion of the other of said closure members,

c. lock means for releaseably securing said faceplate means to one of said closure members, and

d. second bolt means secured to said faceplate means and passing through one of said closure members into an overlapping portion of the other of said closure members,

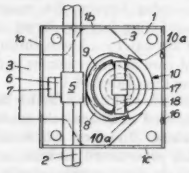
e. one of said upper tracks including a side rail,

f. a portion of said faceplate means abutting said side rail to thereby limit the vertical movement of said closure members in said upper tracks.

3,863,471
ESPAGNOLETTE LOCK
Ernst Keller-Volper, 6, Querstrasse, 8805 Richterswil, Switzerland
Filed Oct. 19, 1973, Ser. No. 408,001
Claims priority, application Switzerland, Oct. 24, 1972, 15507/72
Int. Cl. E05b *63/04;* **E05c** *5/00*
U.S. Cl. 70—116 **3 Claims**

1. Espagnolette lock for the right and left sided latching of doors, windows and the like, comprising a lock box; rotatably closure bar means extending through said lock box; a lock plate having interdigitating means adapted to operatively engage said closure bar means; a cover for said lock box; and nut means rotatably journaled in the wall of said lock box and in said cover, a recess being formed in said nut means adapted to receive a security cylinder, a rectangular through-hole in said nut means, and a slot in one side of said nut means for

insertion of a key bit for actuation of said lock, said nut means having actuating cam means of approximately circular eccentric am configuration, said cam means engaging said lock plate in the region of the axis of symmetry thereof, so as to, upon



rotation of said nut means about an angle of 180°, forcibly move said lock plate from an opened position to a locked position and conversely, and to arrest said lock plate in either of said operative positions.

3,863,472

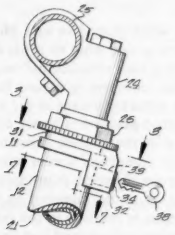
BICYCLE LOCKING DEVICE

Darel R. Klingfus, Rt. 5, Box 232B, Austin, Minn. 55912

Filed Jan. 7, 1974, Ser. No. 431,109

Int. Cl. B62h *5/06*

U.S. Cl. 70—186 **3 Claims**



1. A locking device intended for locking the steering wheel of a bicycle against steering movement, the bicycle having a hollow tubular head with a circumferally formed flange at the top thereof containing the rotating bearing and collar assemblies, a hollow stem extending through the tubular head and connected at the bottom end to a fork in which the front wheel is journaled for rotation, the stem projecting upwardly through the hollow tubular head and connected at the top end to a handle bar post to which steering handle bars are connected, and a lock nut device threadedly received on the tubular head above the flange portion adapted to retain the stem and handle bar posts rotatably mounted relative to the tubular head, the locking device comprising:

a hollow ring shaped mounting member having an interior diameter adapted to receive said tubular head such that the mounting member rests on said tubular head flange portion intermediate said flange and said lock nut, a body portion formed integrally with said mounting member and projecting axially downwardly from one side thereof adapted to be disposed adjacent a portion of the circumferal side walls of said tubular head, an elongated cylindrical bore disposed in said body portion extending radially with respect to said tubular head and opening out of opposed exterior and interior surfaces of said body portion, a locking mechanism housing mounted in said bore and having an exterior surface projecting exteriorly of said exterior surface of said body portion and an interior surface restingly engaging against said interior surface of said bore, a locking mechanism disposed in said lock housing and having a key slot in the exterior surface thereof and a spring loaded key actuated plunger disposed concentrically of the back surface thereof and adapted for axial reciprocal movement in a direction inwardly of and outwardly of said bore, an opening disposed in said tubular head concentric with said bore and adapted to permit said plunger to pass freely therethrough, and an opening in said stem adapted to be disposed in alignment with said plunger in a preselected position of said stem relative to said tubular head whereby when desired said plunger may be operated to pass through said tubular head opening and engage said stem aperture to lock the stem against any rotative movement about its axis and thus lock the attached steering wheel against any steering movement.

3,863,473

CYLINDER LOCK WITH KEY IN PARTICULAR FOR STEERING-WHEEL LOCKS FOR MOTOR VEHICLES

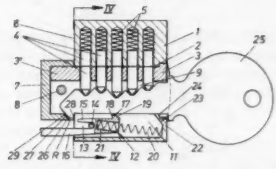
Charles Owen Neale, Luxor, Saval Park Rd., Dublin, Ireland

Filed Aug. 22, 1973, Ser. No. 390,492

Claims priority, application Switzerland, Aug. 28, 1972, 12697/72

Int. Cl. B60r *25/02*

U.S. Cl. 70—186 **10 Claims**



1. A cylinder lock comprising:

a key having a shank provided along one side with lock-actuating formations and another side provided with a lateral projection;

a lock-cylinder housing;

a lock barrel rotatable in said housing and having a keyway adapted to receive the shank of said key;

means between said housing and said barrel cooperating with said formations for enabling relative rotation of said barrel and said housing upon insertion of said key in said keyway, said housing being formed with a longitudinal groove, said projection passing through said groove upon insertion of said key into said keyway, said housing being formed with a space beyond said groove accommodating said projection upon full insertion of said key into said keyway to permit relative rotation of said barrel and said housing, said projection blocking such rotation while being disposed in said groove; and

control means actuated by said projection and external of said keyway for operating a further device.

3,863,474

SUBSTITUTED BENZYL-THIOLCARBAMATE ACID ESTERS AS HERBICIDES

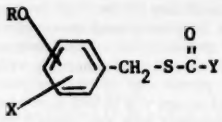
Akio Kudamatsu; Masao Miyamoto, and Nobuo Fukazawa, all of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 875,546, Nov. 10, 1969, abandoned. This application Oct. 12, 1971, Ser. No. 188,431

Int. Cl. A01n *9/12*

U.S. Cl. 71—100 **10 Claims**

6. A herbicidal composition of matter comprising a herbicidally effective amount of a compound of the formula



in which

R is alkyl of 1–4 carbon atoms,

X is selected from the group consisting of chloro, bromo and alkyl having 1–4 carbon atoms, and

Y is dialkylamino having 1–4 carbon atoms in each alkyl moiety, in admixture with a solid diluent or carrier or in admixture with a liquid diluent or carrier and a surface-active agent.

3,863,475

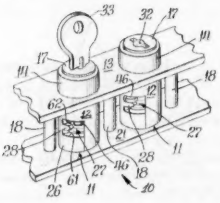
FUNCTION CONTROL KEY LOCKS

Arthur J. Foss, Streamwood, Ill., assignor to Victor Comptometer Corporation, Chicago, Ill.

Filed Feb. 7, 1974, Ser. No. 440,520

Int. Cl. E05b *9/08*

U.S. Cl. 70—360 **9 Claims**



1. Function control key locks, comprising outer support means having a plurality of hollow cylindrical upper casing sections formed integrally therewith, separate inner support means having a plurality of upstanding lower casing sections formed integrally therewith, means for securing said inner and outer support means together to interengage each said upper section with an associated said lower section to present a hollow cylindrical casing, adjacent portions of said associated sections being formed to define a recess in each said casing when said support means are secured together, a key-controlled lock barrel mounted in each said upper casing section for rotation between locked and unlocked positions, a locking plate secured to each said barrel and cooperating with the associated said recess to limit rotational and longitudinal movements of said barrel relative to its associated said casing, and an upwardly spring-urged switch- actuating plunger means mounted in each said casing with a lower end extending downwardly through said inner support means, whereby inward longitudinal movement of said barrel when in unlocked position will depress said switch-actuating plunger means.

3,863,476

PICK RESISTANT LOCK

George P. Patriquin, Gardner, Mass., assignor to Hudson Lock, Inc., Hudson, Mass.

Filed Feb. 9, 1973, Ser. No. 330,971

Int. Cl. E05b *63/00*

U.S. Cl. 70—419 **17 Claims**

1. A lock comprising:

a housing comprising annular retaining means that defines spline means;

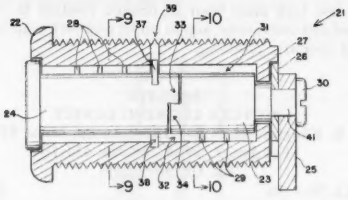
cam actuator means rotatably mounted in said annular retaining means and for operating a locking cam, said cam actuator means defining a keyway for receiving a key;

tumbler restraining means received by said spline means and responsive to a proper key in said keyway for releasably restraining said cam actuator in a preselected position with respect to said housing;

a plug rotatably mounted in said annular retaining means and defining a plug keyway for receiving a key, said keyway and said plug keyway being aligned such that access to said keyway by a key is through said plug keyway when said cam actuator means and said plug are in their preselected positions;

stop means coupled to said cam actuator means for preventing rotation of said cam actuator means in a direction opposite a release direction when said cam actuator means is in said preselected position; and

plug restraining means comprising plug tumbler means received by said spline means and responsive to the



proper key when placed in said plug keyway for releasably restraining said plug in a preselected position with respect to said cam actuator means, said plug restraining means further comprising means for preventing rotation of said cam actuator means in the release direction from the preselected position without corresponding rotation of said plug in the release direction, and wherein said spline means comprises a cam actuator restraining wall spaced a given distance from said tumbler means and disposed so as to be engaged thereby when said cam actuator means is rotating in the release direction, and a plug restraining wall spaced less than said given distance from said plug tumbler means so as to be engaged thereby prior to engagement between said tumbler means and said cam actuator restraining wall during rotation of said cam actuator means in the release direction.

3,863,477

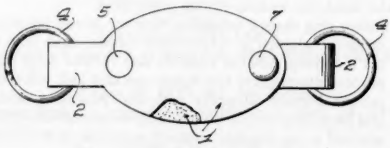
DUAL KEY RING HOLDER

Samuel Klein, Los Angeles, Calif., assignor to Leather Tree, Inc., Los Angeles, Calif.

Filed Jan. 28, 1974, Ser. No. 437,175

Int. Cl. A47g *29/10*

U.S. Cl. 70—456 R **3 Claims**



1. A dual key holder, comprising:

a. a pair of essentially identical holder members;

b. a tab at one end of each holder member formed into a loop;

c. a key ring disposed in the loop;

d. permanent fastening means extending through the tab and corresponding holder member to secure the key ring in the loop;

e. a releasable fastener element carried by each fastening means;

f. and a mating releasable fastener element disposed at the opposite end of each holder member for connection to the corresponding fastener element thereby removably securing the holder members in confronting relation with the tabs extending in opposite directions.

3,863,478

SYSTEM FOR CONTROLLING ROLLING MILLS

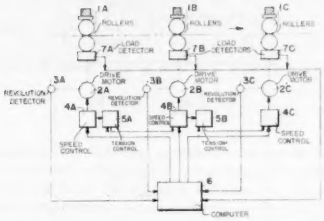
Toshio Harada; Shinichi Nakamata, both of Kisarazu; Shiro Araki; Koei Nakashima, both of Kitakyushu; Hironori Kawasaki, Kimitsu; Kazuo Watanabe, Kitakyushi; Muneo Kawasaki, and Shuhei Niino, both of Kobe, all of Japan, assignors to Nippon Steel Corporation and Mitsubishi Electric Corporation, both of Tokyo, Japan

Filed Sept. 6, 1973, Ser. No. 394,844

Claims priority, application Japan, Sept. 6, 1972, 47-88686; Sept. 6, 1972, 47-88687

Int. Cl. B21b *37/00*

U.S. Cl. 72—6 **15 Claims**



1. A method for providing a zero tension in a steel section between at least two stands of a continuous rolling mill, comprising the steps of:

a. detecting the speed of the steel section when it enters into the first stand and when it emerges from the second stand;

b. determining a plurality of parameters of rolling conditions including at least the sectional area of the steel section between said first and second stands;

c. calculating a control constant based on said detected speeds and said plurality of parameters, so that both the forward slip ratio and backward slip ratio of the steel section may be linearly varied; and

d. modifying the speed of the steel section between said first and second stands in accordance with said control constant so as to maintain the tension of the steel section therebetween substantially zero.

3,863,479

APPARATUS FOR THE PRODUCTION OF A TUBE

Xaver Lipp, Tannhausen Kreis Aslen, Germany, assignor to Silo Verfahrens AG, Zug, Switzerland

Filed Apr. 2, 1973, Ser. No. 346,987

Claims priority, application Germany, Oct. 13, 1972, 2250239

Int. Cl. B21b *37/00*

U.S. Cl. 72—12 **16 Claims**

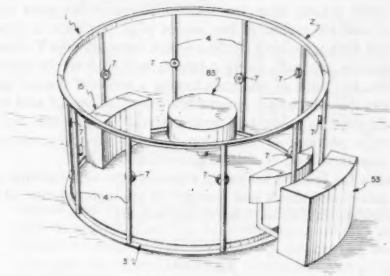
1. A machine for the production of a tube, from a sheet metal strip coiled on a feed reel comprising:

a frame of annular construction which is supported on the ground, the longitudinal axis of said frame being substantially vertical;

supporting rollers carried by said frame and disposed on a helical path extending upward from the bottom end of said frame and supporting the tube at a fold therein, said helical path and said tube supported thereon having substantially vertical longitudinal axes;

a profiling station supported on the ground adjacent said frame and having roller means for defining a path which extends adjacent said helical path defined by said supporting rollers in offset relation to the tube so as to match the bending of the tube wall; and

a folding station adjacent said frame and which is also disposed on the ground so as to be substantially on one side of the wall of the tube when produced, the folding station having a path which coincides with said helical path defined by said supporting roller and which receives the tube,



said profiling station roller means also bending the metal strip, modifying the profile of the metal strip and moving the metal strip through said profiling station,

said folding station having means for folding adjacent profiled edges of the strip together,

said frame comprising

a bottom ring supported on the ground,

a top ring disposed above said bottom ring, and

a plurality of vertical posts interconnecting said top and bottom rings.

3,863,480

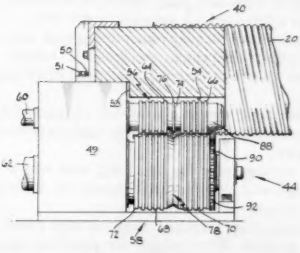
APPARATUS FOR FORMING CORRUGATED STRIP MATERIAL INTO HELICALLY WOUND TUBING

Robert H. Meserole, Toledo, Ohio, assignor to Johns-Manville Corporation, Greenwood Village, Colo.

Filed Aug. 28, 1973, Ser. No. 392,398

Int. Cl. B21c *37/12*

U.S. Cl. 72—50 **10 Claims**



1. Apparatus for forming corrugated strip material into helically wound tubing wherein said strip material has first and second longitudinal edge portions which are complementary with respect to each other with said second edge portion being adapted to be nested within said first edge portion and with each of said edge portions having a longitudinally extending rib means spaced inwardly from the longitudinal edges of said strip material with said rib means being adapted to be folded over toward each other to form a seam of the helically wound tubing, comprising:

mandrel means having a surface about which said strip material is convoluted to set the diameter of the tubing, said mandrel means having a longitudinal axis,

forming roll means located adjacent said mandrel means for nesting said second edge portion within said first edge portion and for initiating a folding over of said rib means toward each other to partially form a seam, said forming means including a roll with a V-shaped groove therein having faces which engage said rib means to initiate the folding over of said rib means, said V-shaped groove having an included angle between said faces greater than 90°, and said V-shaped groove having a mouth with a width greater than the distance between the outer faces of said rib means of the nested edge portions, a second roll with a backing surface which opposes said V-shaped groove, said rolls being rotatably mounted on the apparatus, and each of said rolls having a series of spaced apart annular ribs which extend into corrugations of said strip material to guide said strip material so that said nested edge portions of said strip material are centered with respect to said V-shaped groove, and

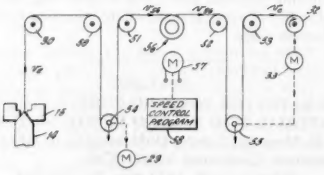
means for feeding said strip material into said forming roll means and about said mandrel at an angle relative to the longitudinal centerline of said mandrel.

3,863,481

AUGMENTED HYDROSTATIC EXTRUSION OF FINE WIRE

James W. Dibrell, Malibu, Calif., assignor to Microwire Corporation, Allentown, Pa.

Filed Jan. 2, 1973, Ser. No. 320,088
Int. Cl. B21c *31/00*
U.S. Cl. 72—9 **27 Claims**



1. An augmented hydrostatic extrusion apparatus comprising, in combination:

hydrostatic extrusion press means for extruding therefrom, under relatively high pressure, a thin wire;

pressure control means connected to said press means for controlling the extrusion pressure within said press means, thereby to control the speed of extrusion of said wire;

a positive drive means operatively connected to said wire for moving said wire away from said press means at given velocity;

a wire reeling stage for receiving wire which has passed through said positive drive means for coiling said wire onto a reel;

a reservoir stage disposed between said press means and said positive drive means for receiving and storing a variable length of said wire therein as said wire moves from said press means to said reservoir stage;

extrusion velocity measuring means for measuring a difference between the extrusion velocity of said wire and the said given velocity;

variable pulling force exerting means for providing a positive pulling force on said wire which leaves said press means, thereby to reduce the necessary hydrostatic pressure needed to cause the escape of wire from the die;

means connecting said variable pulling force exerting means to said extrusion velocity measuring means to increase pulling force responsive to a decrease in extrusion speed of said wire relative to said given speed, and to decrease pulling force responsive to an increase in extrusion speed of said wire relative to said given speed

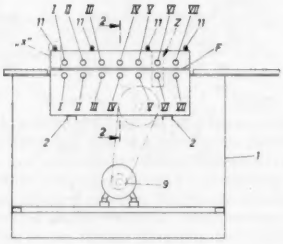
and a second reservoir stage disposed between said positive drive means and said wire reeling stage; and means responsive to the loading and unloading of said second reservoir stage for respectively increasing and decreasing the speed of reeling in said wire reeling stage.

3,863,482

APPARATUS FOR MAKING SHEET-METAL PROFILES WITH FREE-STANDING TONGUES

Karl Heinz Fastenrath, Wermelskirchen, Germany, assignor to Firma Fasti-Werk Carl Aug. Fastenrath, Wermelskirchen/Rhld., Germany

Filed Nov. 7, 1972, Ser. No. 304,373
Claims priority, application Germany, Nov. 13, 1971, 2156463
Int. Cl. B21d *28/36*
U.S. Cl. 72—186 **3 Claims**



1. In an apparatus for producing an angle profile from a sheet-metal strip and comprising a pair of horizontal parallel bearing plates including an upper bearing plate and a lower bearing plate, a plurality of pairs of shafts journaled in said bearing plates, said pairs of shafts being horizontally spaced along said plates and having shaft portions defining a transport path for said strip between the shafts of each pair, the shafts of each pair lying in common vertical planes transverse to said path and being coupled for synchronous rotation, said portions of said shafts being constructed to receive respective strip-profiling rollers, and a common drive for said shafts, the improvement which comprises:

a tongue-cutting head mounted at an intermediate point along said path between two of said pairs of shafts and at another of said pairs of shafts located between said two pairs of shafts, said head including:

an upper housing part mounted on said upper bearing plate and formed with a recess receiving said portion of the upper shaft of said other pair in the absence of its roller; a lower housing part mounted on said lower bearing plate and formed with a r ecess receiving the said portion of the lower shaft of said other pair in the absence of its roller; a first roller blade journaled on one of said housing parts for rotation about a vertical axis for engagement with a flange of a sheet-metal strip advanced along said path and rotatable only be engagement with the latter strip to incise a tongue therein;

a carriage shiftable on the other of said housing parts transversely of said path;

a second roller blade journaled on said carriage for rotation about a vertical axis and adapted to cooperate with said first blade to incise said tongue in the latter sheet-metal strip while being rotated only by engagement with said strip;

spring means bearing upon said carriage to urge said second blade away from said first blade; and

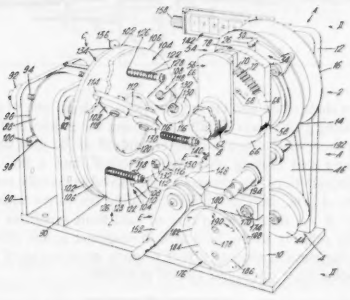
releasable locking means effective against the force of said spring means for retaining said carriage with said blades in cooperating relationship during incising of a tongue in said strip.

3,863,483

APPARATUS AND METHOD FOR CURVING TUBING

Peter C. Wright, Etobicoke, and Donald L. Kirsch, Toronto, Ontario, both of Canada, assignors to Gidon Industries, Inc., Rexdale, Ontario, Canada

Filed May 14, 1973, Ser. No. 359,994
Int. Cl. B21d 7/024
U.S. Cl. 72—219 19 Claims



1. Apparatus for forming successive curves in malleable tubing in relatively offset planes comprising, in combination:
a tube curving head including a forming die about which malleable tubing is curvable and a wiper die spaced from said forming die to permit the tubing to be interposed between it and the forming die, the wiper die being movable to curve said interposed tubing around said forming die whereby to form curves therein;
a rotatable chuck for supporting said tubing in interposed relation between said forming die and wiper die as aforesaid, said chuck being of the feed-through type permitting the tubing to be advanced through the chuck towards the forming die, the chuck including means for yieldingly supporting and gripping the tubing to cause the tubing to rotate with the chuck, said gripping means permitting the tubing to be advanced through the chuck while it is gripped for rotation, and
means for engaging said tubing supported in said chuck and for advancing metered portions thereof through the chuck, while the tubing is gripped for rotation therewith, to said tube curving head for curving as aforesaid; said engaging means including an element in tangential engagement with the tubing and rotatable about an axis transverse to the axis of rotation of the chuck,
the tubing being co-rotatable with the chuck to permit formation of successive curves in relatively offset planes.

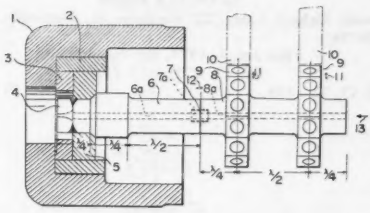
3,863,484

APPARATUS FOR DRAWING WIRES AND TUBES

Hitoshi Tsuji; Takeshi Murayama; Shigeo Kawahata; Isamu Komine; Satoshi Huziwara, and Mikio Ueki, all of Kawasaki, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Kanagawa Ken, Japan

Filed Feb. 22, 1972, Ser. No. 295,831
Claims priority, application Japan, Feb. 25, 1971, 46-8987
Int. Cl. B21c 1/00
U.S. Cl. 72—274 8 Claims

1. Apparatus for drawing tubes and wires comprising:
a drawing die (4) having an entry and an exit, and an opening defining a passage therebetween;
a vibration source (8,9,10);
an elongated energy transmitting device (6) secured to the entry side of said die (4) and coupling said vibration source (8,9,10) to said die (4), said energy transmitting device (6) being provided with an axial bore (6a) in the longitudinal direction thereof and in the axial direction of said die opening, through which material to be drawn may be fed to the entry of said die;
said vibration source (8,9,10) including at least one vibrational energy source (9,10) for generating vibrational energy in a direction substantially perpendicular to the



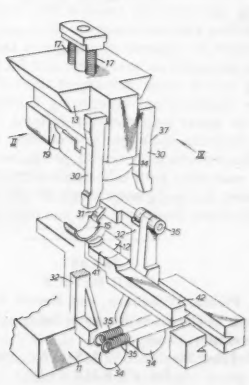
axis of said axial bore of said energy transmitting device, and means (8) coupling said vibrational energy source (9,10) to said energy transmitting device (6) and for changing the direction of said vibrational energy by 90° so that the resulting vibrational energy is in the direction of said axis of said axial bore (6a) of said energy transmitting device (6), whereby substantially all of said resulting vibrational energy is imparted to said die in the direction of drawing of material through said drawing die (4).

3,863,485

PRESS AND METHOD FOR COIN PRESSING ARTICLES

Frank MacDonald, Irvine; David Michael Gardner, Kilmarnock, and Roy Stephens, Prestwick, all of Scotland, assignors to The Glacier Metal Company, Limited, Wembley, Middlesex, England

Filed May 11, 1973, Ser. No. 359,469
Claims priority, application Great Britain, May 11, 1972, 21994/72; May 11, 1972, 21995/72
Int. Cl. B21d 37/12
U.S. Cl. 72—345 10 Claims



1. A press for coin-pressing separate blanks into semi-cylindrical bearing shells including a pair of forming tools having complementary opposed semi-cylindrical surfaces for forming opposite faces of the shells, and a mechanical drive for bringing the tools together to form the shells, and including also side pieces arranged to come together to clamp the side faces of the blanks while they are being formed into the semi-cylindrical shape, but to be released after the forming tools

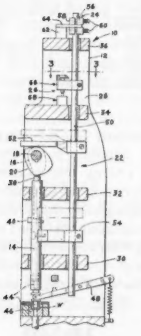
move apart when the shells have been formed, a member having a surface which is held against the joint faces of the shells to locate them during forming, whereby all the faces of the blanks are located during forming and retaining means locating said shells in position after forming and following release thereof from said forming tools.

3,863,486

TRANSFER PRESS

Donald Richard Lassy, 22 Matthews St., Terryville, Conn. 06786

Filed Jan. 4, 1974, Ser. No. 430,883
Int. Cl. B21j *9/18, 13/00*
U.S. Cl. 72—405 **17 Claims**



1. In a transfer press having a frame, a plunger supported on said frame for movement in one and an opposite direction relative thereto, a lifting rod mechanism supported on said frame and including a lifting rod disposed in axially parallel relation to said plunger and connected thereto for movement therewith, a cam shaft supported on said frame for rotation relative thereto, a plunger cam mounted in fixed position on said shaft for rotation therewith and engagable with said plunger for positively driving it in said one direction in response to rotation of said shaft, a lifting cam mounted in fixed position on said shaft for rotation therewith and engagable with said lifting rod mechanism to drive said plunger in said other direction in response to rotation of said shaft, and friction means mounted on said frame and frictionally engaging said lifting rod to resist movement thereof relative to said frame, the improvement comprising a limit stop assembly including an upper stop member defining a first abutment, means for securing said upper stop member to said lifting rod assembly for movement therewith, and means defining second abutment associated with said frame and in the path of said first abutment for engagment with said first abutment to limit movement of said plunger in said one direction.

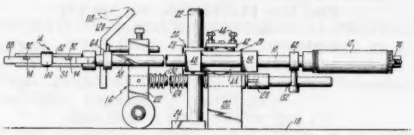
3,863,487

FEED DEVICE

Edwin W. Plumb, Woodbury, and Harold T. Meikis, Waterbury, both of Conn., assignors to Safeguard Manufacturing Co., Woodbury, Conn.

Filed May 16, 1973, Ser. No. 360,850
Int. Cl. B21d *43/02*
U.S. Cl. 72—421 **7 Claims**

3. In a feed device particularly well suited to secondary feeding operations in the confined work area of a power press or the like comprising an elongated feed arm having a drive member on one end thereof and a pair of gripping jaws on the opposite end thereof movable between open and closed positions and an adjustable support slidably mounting the feed arm for linear movement relative to the support and simultaneous rotational movement about the axis of the feed arm for rotatably orienting the gripping jaws and moving the jaws toward and away from the power press, the combination comprising a jaw actuating mechanism operatively connected to the drive member for linear and rotational movement with the feed arm, said mechanism including adjustable limiting means preventing linear movement of the feed arm beyond predetermined forward and rearward limit positions, jaw stabilizing and aligning means including a pair of spaced guides spanning the jaws and controlling movement of the jaws be-



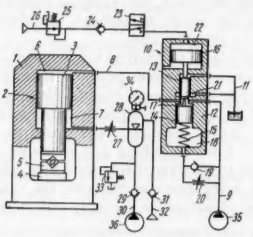
tween their open and closed positions, at least one of said jaws including guideways slidably receiving the guides and cooperating therewith to prevent misalignment of the jaws during the opening and closing movement thereof, and a jaw actuator interposed between the jaws and movable axially relative to the feed arm, said jaw actuator being operative upon movement of the feed arm to one of said limit positions to move axially relative to the feed arm in response to the drive member and simultaneously effect relative movement of the jaws between their open and closed positions.

3,863,488

HYDRAULIC PRESS WITH PULSATING LOAD

Nikolai Trifonovich Deordiev, ulitsa Fridrikha Engelsa, 42, kv. 40; Ivan Vasilievich Kononov, ulitsa Torpedo, 40, kv. 4; Ivan Egorovich Maslennikov, ulitsa Druzhinnikov 26, kv. 82; Gennady Vitalievich Modzheevsky, ulitsa Koltsovskaya 82, kv. 35; Vladimir Nikiforovich Platonov, ulitsa 9 Yanvarya 49, kv. 45, and Vasily Tikhonovich Sukhanov, Bulvar Pionerov 20, kv. 73, all of Veronezh, U.S.S.R.

Filed July 10, 1973, Ser. No. 377,911
Int. Cl. B21j *9/12*
U.S. Cl. 72—453 **1 Claim**



1. A hydraulic press with a pulsating load comprising a bed, a power cylinder provided with a piston; said cylinder being arranged on said bed and having above-piston and under-piston spaces; a source of liquid high pressure; a drain; a pulsator serving for the creation of a pulsating load in said power cylinder; said above-piston space serving for the working stroke of the piston being connected to the said source of the liquid high pressure and through said pulsator to the drain; a pipeline connecting said under-piston space to a source of liquid high pressure serving for the return of said piston to its initial position; a one-way valve mounted on said pipe-line; and a throttle and high pressure accumulator arranged in consecutive order on said pipeline between said under-piston space and said one-way valve enabling the control of the amplitude of oscillation of said piston.

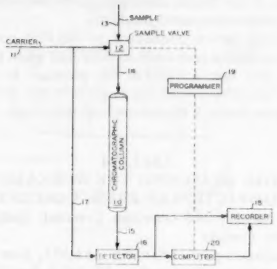
3,863,489
ANALYSIS OF CHROMATOGRAPHIC PEAKS BY MOMENTS

Buell O. Ayers, and Edwin K. Clardy, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 873,269, Nov. 3, 1969, abandoned. This application Oct. 19, 1970, Ser. No. 82,087

Int. Cl. G01h *31/08*

U.S. Cl. 73—23.1 **3 Claims**



1. The method of obtaining data useful in determining the relative concentrations of first and second constituents of a fluid mixture by chromatography when said constituents have approximately the same retention times, which method comprises:

introducing into a chromatographic analyzer a sample of the fluid mixture, and operating the analyzer to produce a first chromatogram wherein the composition of the analyzer effluent is measured with respect to time;

introducing into said analyzer a sample of said first constituent, and operating the analyzer to produce a second chromatogram wherein the composition of the analyzer effluent is measured with respect to time;

introducing into said analyzer a sample of said second constituent, and operating the analyzer to produce a thrid chromatogram wherein the composition of the analyzer effluent is measured with respect to time; and

computing the moments of the peaks of said constituents in each of said chromatograms with respect to a common reference point of time, whereby a comparison of the resulting moments provides an indication of the relative amounts of said first and second constituents in the first chromatogram.

3,863,490
METHOD OF AND APPARATUS FOR AVOIDING ERRONEOUS INDICATIONS AS A RESULT OF THE PROPERTIES OF THE PAPER IN APPARATUS WHICH USE A PAPER TAPE AS MEASURING MEANS

Otto Blunck, and Karl-Heinz Retzow, both of Hamburg, Germany, assignors to Firma H. Maihak AG, Hamburg, Germany

Filed Apr. 10, 1973, Ser. No. 349,730

Claims priority, application Germany, Apr. 11, 1972, 2217285

Int. Cl. G01n *21/28*

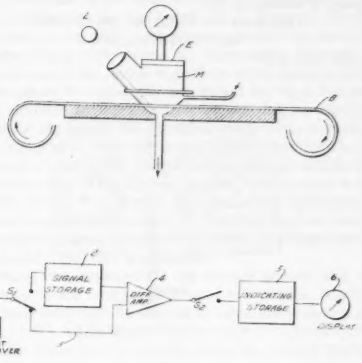
U.S. Cl. 73—28 **2 Claims**

1. A method of avoiding errors in indication due to the properties of the paper in apparatus which uses a paper tape as a means of gas measurement, comprising the steps of

causing a gas to act on a paper tape,

producing momentarily a presignal corresponding to a background of said paper tape at a point of the paper tape upon the commencement of the action of a gas on said paper tape,

electronically feeding a second signal corresponding to the action of said gas on said paper tape continuously during the action of the gas into a difference stage, and



forming a difference between said presignal and said second signal determined at an end of the time of action of said gas by said difference stage, and

causing said difference to be indicated.

3,863,491
METHOD AND APPARATUS FOR TESTING CIGARETTES

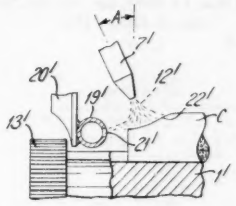
Desmond W. Molins, London, England; Francis A. M. Labbe, Neuilly-sur-Seine, France; Harry Parkinson; Peter Kirk, both of London, England, and Robert J. Hayward, New South Wales, Australia, assignors to Molins Limited, London, England

Filed Jan. 22, 1973, Ser. No. 325,799

Claims priority, application Great Britain, Jan. 21, 1972, 2897/72

Int. Cl. G01m *3/26*

U.S. Cl. 73—37 **37 Claims**

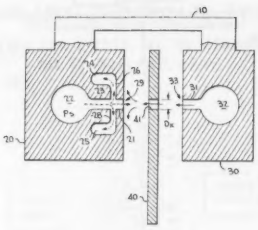


1. A method of testing a cigarette, comprising directing a stream of air against the side of the cigarette adajcent to one of its ends with a velocity sufficient to deform the end portion of an inadequately filled cigarette in which event said air stream is deflected towards a first region spaced from said end portion but insufficient to deform the end portion of an adequately filled cigarette in which event said air stream is deflected towards a second region spaced from said end portion and remote from said first region, and detecting the presence of the air stream in said first region to which said air stream is deflected by the deformed side of an inadequately filled cigarette.

3,863,492
APPARATUS FOR MEASURING THE DIAMETER FOR THROUGH HOLES

R. Pierce Trask, II, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 28, 1973, Ser. No. 374,606
Int. Cl. G01b *13/08*
U.S. Cl. 73—37.5 9 Claims

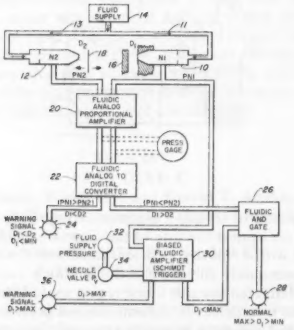


1. An apparatus for measuring the diameter of through holes in a wink piece comprising:
   a. spaced apart interconnected fluid supply means including first and second means, said work piece being inserted therebetween;
   b. b said first means for emitting a constant emitter jet of fluid through a through hole in said work piece;
   c. said second means for emitting a constant jet of fluid opposing said emitter jet, said second means being located on the side of said hole opposite said first means;
   d. means for receiving fluid deflected from said opposed fluid supply jets; and,
   e. means for measuring the pressure of said deflected fluid whereby the diameter of said through hole is determined.

3,863,493
COMPENSATED FLUIDIC BEARING CLEARANCE MONITOR

Charles C. Busenkell, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 23, 1973, Ser. No. 418,790
Int. Cl. G01b *13/12*
U.S. Cl. 73—37.5 4 Claims



1. A fluidic indicating system for monitoring clearances in a hydrostatic bearing comprising:
   a. a first nozzle mounted in the bearing housing adjacent to the bearing;
   b. a second nozzle mounted in close proximity to said first nozzle so that said first and second nozzles are in the same environment;
   c. a plate mounted adjacent to the output of the second nozzle a predetermined distance;
   d. a pressurized fluid supply connected through identical lines to said first and second nozzle;
   e. a fluidic analog proportional amplifier connected to said first and second nozzles for amplifying any pressure difference between the two nozzles;
   f. a fluidic analog to digital converter connected to the outputs of the fluidic analog proportional amplifier, and having first and second outputs;
   g. a warning device connected to the first output of the analog to digital converter to indicated when the pressure in the first nozzle exceeds the pressure in the second nozzle whereby a warning is given when bearing clearance goes below a predetermined minimum.

3,863,494
DEVICE FOR MEASURING THE WORKABILITY AND COMPACTION OF FRESH CONCRETE

Karim W. Nasser, 204 Garrison Crescent, Saskatoon, Saskatchewan, Canada

Continuation-in-part of Ser. No. 151,351, June 9, 1971, abandoned. This application Oct. 25, 1973, Ser. No. 409,595
Claims priority, application France, Aug. 14, 1973, 73.29769
Int. Cl. G01n *11/00, 33/38*
U.S. Cl. 73—54 11 Claims

1. A device for use in determining the workability, consistency, slump and compaction of a freshly prepared concrete mix which comprises a tube including a central bore, a member fixedly attached to and extending substantially transversely of said tube for limiting the depth to which said tube may be inserted into said mix, a plurality of apertures each in the shape of a slot extending from a closed end of the tube remote from the transverse member partially along said tube, including between the ends of said slotted apertures and said transverse member at least one set of a plurality of small apertures disposed around the periphery of said tube through which apertures said mix may enter said bore on insertion of said device into said mix, and index means associated with said tube for determining the residual height to which the mix is present in the bore of said tube on withdrawal of said device from said mix.

3,863,495
QUARTZ CRYSTAL SOLUTE MASS DETECTOR

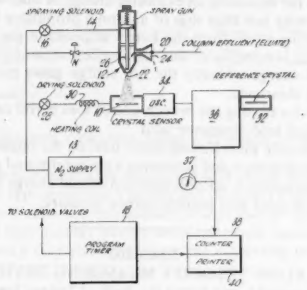
Wolfgang W. Schulz, Warren, and William H. King, Jr., Florham Park, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 16, 1973, Ser. No. 351,339
Int. Cl. G01n *5/04*
U.S. Cl. 73—61.1 C 10 Claims

1. A method of measuring the mass of materials which have been separated in a liquid-liquid chromatographic column and

subsequently eluted in a sequential manner by a carrier solvent according to their physical characteristics as an eluate stream comprising the following steps in combination:

a. sampling an accurately reproducible amount of said eluate stream at uniform intervals during the elution of said materials, whereby the samples are representative of the separated material in said column;



b. depositing each of said eluate samples on a first crystal;

c. rapidly evaporating the carrier solvent from each of said eluate samples; and

d. measuring the resonant frequency of said first crystal after said carrier solvent has been evaporated from each sample.

3,863,496

CURVED SURFACE SCANNING APPARATUS

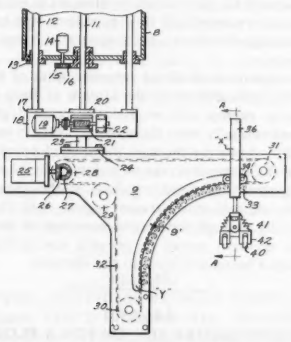
Tsunehisa Hiramatsu, Miki, and Hiroshi Nosaka, Kakogawa, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 7, 1973, Ser. No. 395,077

Claims priority, application Japan, Sept. 30, 1972, 47-113802[U]; Sept. 30, 1972, 47-113803[U]

Int. Cl. G01n *29/04*

U.S. Cl. 73—67.8 S **5 Claims**



1. Apparatus for scanning the saddle shaped intersection of the bores of a first tubular member with a second tubular member from inside the base of the first tubular members, comprising:

a main body;

support means for disposing the main body in the first tubular member for rotation therein about the longitudinal axis of the bore of the second tubular member;

means defining an arcuate track on the main body, concave toward the saddle generally about an axis which remains perpendicular to the longitudinal axis of the bore of the second tubular member as the main body is rotated as aforesaid;

a slider mounted on the main body for movement along the track and means for moving the slider along the track;

longitudinally extensible arm means mounted on the slider and provided with means for maintaining the arm directed toward the saddle regardless of the position of the slider along the track, the arm means having a first portion secured to the slider, a second portion disposed adjacent the saddle and provided with a contact member for engaging at least one of the tubular members in the vicinity of the saddle shaped intersection to standardize the proximity of the second portion with respect to the saddle shaped intersection, and means for extending the second portion with respect to the first portion, toward the saddle shaped intersection to ensure engagement of the contact member as aforesaid;

a scanning unit mounted on the second portion and and oriented to scan the saddle shaped intersection, whereby the main body may be rotated to cause the scanning unit to scan the saddle shaped intersection at a given radius, and the slider may be moved along the arcuate track to change the radius of scanning.

3,863,497

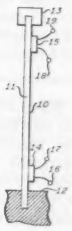
ACOUSTIC DELAY SURFACE WAVE MOTION TRANSDUCERS

Herman van de Vaart, Harvard; Hugh B. Matthews, Acton, and James C. Worley, Sudbury, all of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 24, 1972, Ser. No. 300,034

Int. Cl. G01h *1/00*; **G01p** *15/00*

U.S. Cl. 73—71.2 **18 Claims**



1. Transducer means comprising:

elongate cantilever flexure means having first and second ends and a flexible surface layer adapted to propagate acoustic waves,

exciter means for exciting and propagating said acoustic waves along a predetermined path at said flexible surface layer,

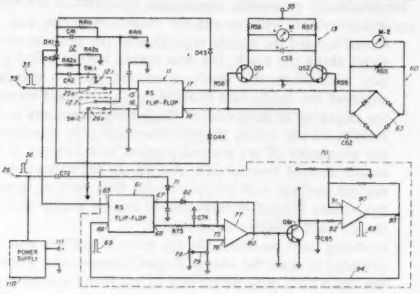
receiver means along said path for receiving and converting said acoustic waves into electrical signals,

signal generator means for driving said exciter means, and signal processing circuit means responsive to said signal generator means and to said receiver means for deriving a measure of the flexure of said flexure means.

3,863,498
ENGINE TIMING METER

Bernd Gunther, Framingham, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed July 28, 1972, Ser. No. 276,232
Int. Cl. G01m *15/00*
U.S. Cl. 73—118 **11 Claims**



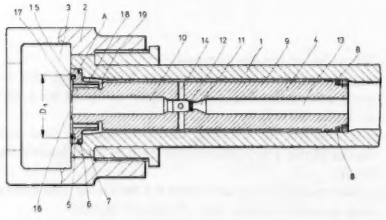
1. Method of measuring ignition timing of an internal combustion engine having a crankshaft and an even number of cylinders comprising steps of:

generating in each revolution of said crankshaft a reference signal which coincides in time with the same specified angular position of said crankshaft, whereby upon successive revolutions of said shaft to generate a train of said reference signals which are spaced apart in time proportional to the rotational velocity of said shaft, generating in alternate ones of said revolutions a first series of ignition signals each of which substantially coincides in time with an ignition pulse supplied to a first of a pair of said cylinders which fire 360° apart, generating in intervening ones of said revolutions a second series of ignition signals each of which substantially coincides in time with an ignition pulse supplied to the second of said cylinders, generating an electric wave train by shifting between a first predetermined voltage value and a second predetermined voltage value in response to, respectively, said reference signals and said ignition signals, and measuring the average DC level between said voltage values.

3,863,499
SIMULATING FIRING STRESSES IN GUN BARRELS

Sigmund Von Boutteville, Dusseldorf, and Horst Rekittke, Oberwinter, both of Germany, assignors to Firma Rheinmetall G.m.b.H., Dusseldorf, Germany

Filed July 19, 1972, Ser. No. 273,270
Claims priority, application Germany, Aug. 7, 1971, 2139735
Int. Cl. G01l *5/14;* **G01n** *25/54*
U.S. Cl. 73—167 **3 Claims**



1. An apparatus for testing gun barrels by simulating actual firing stresses without a projectile therein comprising:

a gun barrel;

an insert body mounted in the loading chamber of said gun barrel to reduce the volume of said loading chamber and extending axially along part of the length thereof, the middle portion of said insert body defining an annular clearance between the ends of said body and the inner wall of said gun barrel, said ends of the insert body sealingly engaging said inner wall of the gun barrel;

means for mounting an explosive charge in said barrel of an intensity less than that of a normal propulsive charge for ejecting shells from the barrel to produce gas at an elevated temperature, said clearance communicating with said charge whereby the hot charge gases pass through said clearance;

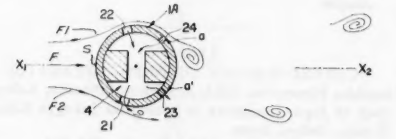
means for closing the breech end of said barrel on one axial side of said clearance; and

a rupturable plate closing said barrel on the opposite side of said clearance and sustaining a predetermined pressure in said clearance upon detonation of said charge but rupturing beyond said predetermined pressure.

3,863,500
FLOW VELOCITY MEASURING DEVICE

Hiroo Yamasaki, and Ichizo Ito, both of Tokyo, Japan, assignors to Yokogawa Electric Works Ltd., Tokyo, Japan

Filed Apr. 5, 1973, Ser. No. 348,121
Claims priority, application Japan, Apr. 27, 1972, 47-42472
Int. Cl. G01f *1/00;* **G01p** *5/10*
U.S. Cl. 73—194 B **13 Claims**



1. Flow metering apparatus of the type wherein a vortex generating element is placed transversely in a stream of fluid to produce on opposite sides of the element vortices which are shed in alternating fashion, and wherein the element is formed with openings along said opposite sides which are connected together through the interior of the element to produce therethrough an alternating fluid flow corresponding to the alternating shedding of vortices, such apparatus being characterized in that:

the openings on each of the opposite sides of the element are arranged relative to the stream of fluid both in an upstream region and in a downstream region spaced circumferentially from the upstream region such that the fluid flow inwardly through the spaced openings on one side of the element serves to maintain the boundary layer of the stream of fluid attached to the element to the vicinity of said downstream region, said fluid flowing outwardly through the spaced openings on the other side of the element serves to prevent reattachment of the spearated boundary layer to the element.

3,863,501
MAGNETOSTRICTIVE SENSOR FOR A FLOWMETER

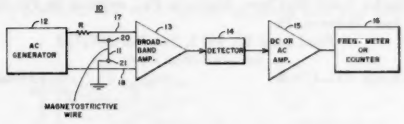
John E. Janssen, Minnetonka; Vahram S. Kardashian, Plymouth, and Paul Antonio Corbero, Minneapolis, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 19, 1973, Ser. No. 426,268
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 B **7 Claims**

1. A flowmeter of the type having a turbulence induced therein which has an oscillatory type component, the repetition rate of which is a function of flow rate, the combination comprising:

a magnetostrictive flow sensing means comprising a length of spring wire having plated thereon a magnetically anisotropic magnetostrictive thin-film,

means mounting said wire to extend into a fluid flow path, whereby the oscillatory type component of flow causes a vibratory deflection of said plated wire, the frequency of



said vibratory deflection being a function of flow rate, and

a.c. generator means for energizing said plated wire with a carrier type wave and wherein said vibratory deflection of said wire effects a modulation of said carrier wave, said plated wire further having terminal means connected to frequency responsive signal output measuring means.

3,863,502

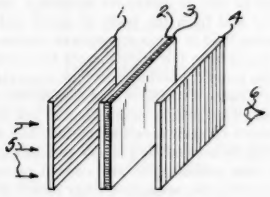
VISUAL-TYPE HYGROMETER

Stanley B. Elliott, 7123 Conelly Blvd., Bedford, Ohio 44146

Division of Ser. No. 18,921, March 12, 1970. This application Apr. 19, 1972, Ser. No. 245,550

Int. Cl. G01w *1/06*

U.S. Cl. 73—336 **8 Claims**



1. A visual-type humidity and temperature responsive device comprising: (1) a source of illumination providing a light beam, (2) a chemical composition that of itself senses changes in temperature and relative humidity, the composition being birefringent at a first relative humidity and temperature and non-birefringent at a second relative humidity and temperature, (3) means to amplify observable changes in composition due to changes in relative humidity and temperature including a polarizer for the light beam and an analyzer for the polarized beam that is passed through the composition, and (4) light detecting means for detecting changes in the brightness and intensity of light coming from the composition because of changes in relative humidity and temperature.

3,863,503

MULTISPEED, CHAINLESS VEHICLE DRIVE SYSTEM

David C. Loeb, 7227 S. Claiborne Ave., New Orleans, La. 70125, and Robert Trestman, 6649 Memphis St., New Orleans, La. 70124

Filed Apr. 30, 1973, Ser. No. 355,592

Int. Cl. F16h *3/30*

U.S. Cl. 74—347 **9 Claims**

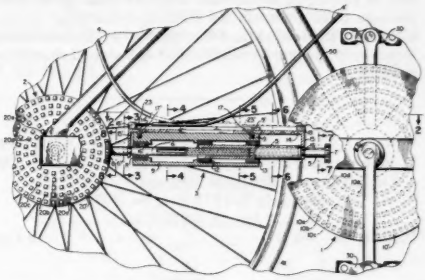
1. A multispeed, chainless drive system for a vehicle of the occupant propelled type conmprising:

a first gear wheel mounted on a rotatable drive axle:

a second gear wheel spaced from said first gear wheel and mounted on a rotatable vehicle drive wheel, both of said gear wheels having projecting therefrom multiple rows of concentric gear teeth disposed in a circular array about the axis of rotation of said gear wheel;

variable length drive shaft means mounted between and rotatably interconnecting said first and second gear wheels for transmitting the rotating force from the drive axle and first gear wheel to the second gear wheel and ultimately to the vehicle drive wheel, both ends of said drive shaft means having contact gear means fixedly mounted thereon for mating individually with selected one of said rows of concentric gear teeth on each said gear wheels, said drive shaft means further including

first and second, elongated, concentric rotatable shaft sections, each carrying one of said contact gear means, one slidably mounted in a longitudinal or axial direction



within the other to vary the effective length of the said drive shaft means to position said contact gear means with different ones of said rows of concentric gear teeth, said first and second shaft sections being connected together to rotate in unison and in combination extending across from one gear wheel to the other; and

gear shifting means mounted on the vehicle and attached to said shaft sections for moving the contact gear means from engagement with one row of gear teeth to another row by relatively moving said shaft sections for moving the contact gear means from engagement with one row of gear teeth to another row by relatively moving said shaft sections in a longitudinal or axial direction with respect to each other and with respect to said gear shifting means.

3,863,504

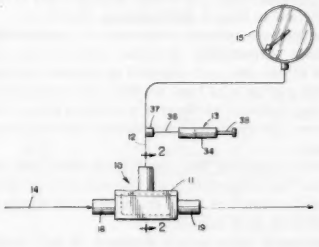
PRESSURE GAUGE PROTECTOR ASSEMBLY AND METHOD

Alexander S. Borsanyi, Irvine, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 9, 1973, Ser. No. 339,516

Int. Cl. G01l *7/08*

U.S. Cl. 73—395 **6 Claims**



1. A gauge protector assembly for measuring the pressure of a fluid by a gauge without having the fluid contact the gauge comprising a casing having an inner cavity and inlet and outlet

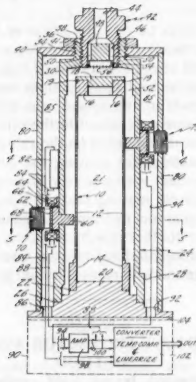
openings communicating with the cavity, a flexible diaphragm secured to the casing within the cavity and dividing the cavity into first and second chambers, at least a portion of the casing being transparent to permit the diaphragm to be observed from outside of the casing, both of the inlet and outlet openings communicating with the first chamber but not the second chamber to provide a first fluid flow passage through the first chamber between the inlet and outlet openings, the casing being provided with a third opening communicating with the second chamber but not the first chamber, conduit means connected to the third opening and adapted to be connected to a pressure gauge to provide a second fluid flow passage through the third opening between the second chamber and the conduit means, and means for injecting a fluid into the second fluid flow passage whereby the fluid to be measured can be connected to the first fluid flow passage so that the pressure thereof acts on the diaphragm and fluid can be injected into the second fluid flow passage by the fluid injecting means until the pressures in the first and second chambers are equal.

3,863,505

VIBRATING CYLINDER PRESSURE TRANSDUCER

E. Marston Moffatt, Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed July 9, 1973, Ser. No. 377,868
Int. Cl. G011 *9/10*
U.S. Cl. 73—398 R **19 Claims**



1. A vibrating cylinder pressure transducer subcombination comprising:

a base member;

a vibrating cylinder composed of material having magnetic permeability, closed at one end and disposed in pressure sealing relationship against said base member at the other end thereof to form a first pressure chamber;

an outer pressure cylinder composed of a substantially low magnetic permeability material, and at least partially closed at one end and disposed in pressure sealing relationship against said base member and surrounding said vibrating cylinder to form a second pressure chamber between said vibrating cylinder and said outer pressure cylinder;

inlet means provided for one of said chambers so as to provide fluid communication between one of said chambers and a source of fluid, the pressure of which is to be measured by said transducer;

electromagnetic drive means disposed on said outer pressure cylinder and in driving relationship with said vibrating cylinder;

electromagnetic sensing means disposed on said outer pressure cylinder and in sensing relationship with said vibrating cylinder; and

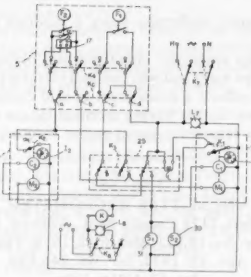
low reluctance magnetic path means disposed externally of said outer pressure cylinder for providing a return path for magnetic flux through said electromagnetic means and said vibrating cylinder.

3,863,506

LIQUID SAMPLING

Charles Laird McClure, Malvern, Pa., assignor to Pro-Tech Inc., Malvern, Pa.

Filed June 13, 1973, Ser. No. 369,722
Int. Cl. G01n *1/14*
U.S. Cl. 73—421 B **12 Claims**



1. In apparatus for sampling liquid from a body thereof at predetermined intervals of time between and for predetermined periods of time at successive samplings, including conduit means to and from the body of liquid and adapted to receive gaseous fluid at superatmospheric pressure to propel samples of liquid from the body thereof to a collecting location during the sampling periods, the improvement comprising a pair of like electrical timing means, one for determining the interval between successive samplings and one for determining the duration of each sampling period, and including an indicator of the time remaining in any current sampling interval and the time remaining in any current sampling period; means for switching the respective timer means alternately off and on, each one being switched on when the other has counted down to zero time remaining, for an automatic mode of operation; switch means for inactivating such automatic switching and interconnecting the apparatus for operation in accordance with signals supplied from an external source, the first timing means including electrical means for totalizing time-duration signals and the second timing means including electrical means for determining the duration of sampling periods; and switch means interposed between the electrical means and the external signal source together with electrical interconnectors therebetween such that in one position of the switch means the external signal source is connected to the totalizing electrical means and in another position of the switch means the external signal source is connected to the electrical means for determining the duration of sampling periods.

3,863,507

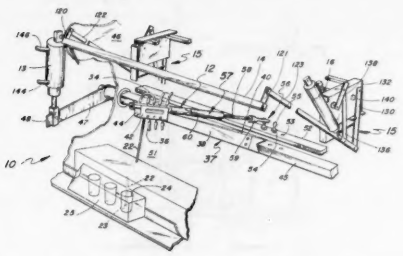
SAMPLE MIXING AND METERING APPARATUS

Alan Richardson Jones, Miami, and Thomas J. Godin, Hollywood, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Mar. 16, 1973, Ser. No. 342,161
Int. Cl. G01n *31/00*
U.S. Cl. 73—423 A **6 Claims**

1. A sampling head for use at a sample pickup station, said head comprising a hollow sample pickup probe adapted to be inserted into a sample container at a sample pickup station for extracting a given amount of fluid sample from the container, said pickup probe being movable between a first or sampling

position and a second or retracted position, valve means operable upon movement of said probe to said sampling position for connecting said probe to means for withdrawing fluid from the sample container through said probe, and means for moving said probe and simultaneously operating said valve means whereby said valve means is operated by said moving means to connect said probe to the withdrawing means at the same time said probe is moved by said moving means to said sampling position, said valve means including first and second



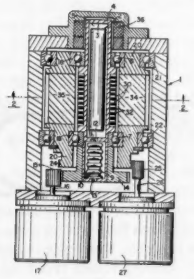
movable valve blocks each having at least one passageway therethrough, said passageways being aligned with each other and with said probe when said probe is in said retracted position and said valve means is in a sample delivery and probe cleaning position, and said moving means includes lost motion means which permits said head to be lowered a predetermined distance with said valve blocks maintained in place defining said sample delivery and probe cleaning position of said valve means.

3,863,508

ACCELEROMETER

William M. Scarborough, Whittier, and Doyle E. Wilcox, La Puente, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 2, 1959, Ser. No. 784,819
Int. Cl. G01p *15/08*
U.S. Cl. 73—516 R **19 Claims**



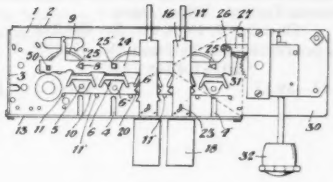
1. In an integrating type of device for measuring accelerations, the combination of: a housing a cylindrical proof mass of non-magnetic, electrically conductive material; positioned within and longitudinally with respect to said housing; bearing means, positioned in said housing for permitting frictionless translation of said proof mass parallel to the cylindrical axis thereof, while restraining movement of said proof mass transversely of said axis, said bearing means positioned in close proximity to the surface of said proof mass; means mounted on said housing adjacent one end of said proof mass, for sensing axial displacements due to accelerations of said proof mass; means for restoring said mass to null position after axial displacement, comprising rotating magnetic means for setting up magnetic fields travelling axially of said proof mass for inducing currents in said proof mass in such a direction as to produce magnetomotive restoring axial forces equal and opposite to those producing such translations, said restoring means comprising a pair of magnets mounted on said housing with their opposed poles adjacent the outer surface of said proof mass; and means for measuring the restoring forces necessary to balance the axial forces due to said accelerations as a function of the speed and number of revolutions of said rotating magnetic means for producing said induced currents.

3,863,509

KEYBOARD FOR THE PRESELECTION OF ELECTROMAGNETIC SIGNALS

Carmelo Zimatore, and Amedeo Pezzini, both of Rome, Italy, assignors to Autovox S.p.A., Rome, Italy

Filed Jan. 3, 1974, Ser. No. 430,589
Claims priority, application Italy, Jan. 17, 1973, 47733/73
Int. Cl. F10h *35/18*
U.S. Cl. 74—10.33 **9 Claims**



1. In a keyboard for receivers, particularly for autoradios, for pre-setting them to the reception of as many transmitters as there are keys on siad keyboard, in which keyboard said keys are of a variable length and carry, fulcrumed to them, cams which can be locked in varying inclinations with respect to the key axis, said cams coacting with means to transmit said inclination to the tuning system of said receiver, the improvement that:

each key cam coacts with cams, whose one end is pivotably mounted on a plate, each cam presenting an ear at both sides of its pivot, said ears being coplanar with said key cam and capable of being moved into engagement with the latter;

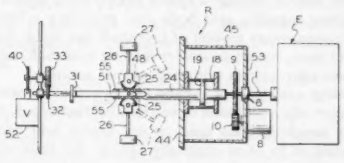
each of the opposite end of said eared cams is linked by a pin to a flat bolt, one end of said bolt being disconnectably linked to the tuning system of said receiver, said eared cams and said bolts forming the means to transmit the key cam inclinations to said tuning system.

3,863,510

INERTIA ENGINE

Everett H. Benson, Rt. 1, Box 429, Eagle Creek, Oreg. 97022

Filed Jan. 16, 1974, Ser. No. 433,933
Int. Cl. F16h *33/12*
U.S. Cl. 74—64 **7 Claims**



1. An inertia engine comprising a reaction mechanism adapted to be driven by a vehicle-mounted prime mover, the reaction mechanism including:

a rotatable drive shaft,

a mass and means attaching said mass to said drive shaft for rotation with said drive shaft,

and means for moving said mass inwardly toward said drive shaft and for partially releasing said mass for movement outwardly away from said drive shaft in a direction having a component axial of said drive shaft for providing thrust in the last mentioned direction, said mass moving outwardly in response to centrifugal force as said mass is rotated by said drive shaft.

3,863,511

APPARATUS FOR OPENING THE SAND DISCHARGING DOOR FOR HOPPER BARGES

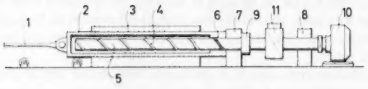
Keizo Kikui, Chiba, Japan, assignor to Mitsui Shipbuilding and Engineering Co. Ltd., Tokyo, Japan

Filed Oct. 9, 1973, Ser. No. 404,792

Claims priority, application Japan, Oct. 12, 1972, 47-118140

Int. Cl. F16h *27/02*

U.S. Cl. 74—89.15 **1 Claim**



1. The method of operating a sand or soil discharging door for a hopper barge in which said door is positioned and mounted to be urged open by the weight of said sand or soil, comprising:

providing a mechanism comprising a slidable body connected to said door so as to be slid in one direction when said door is opening and in the opposite direction when said door is closing, a rotary shaft having helical groove means engaging said body and providing a conversion between rotary motion of said shaft and linear motion of said body, motor means for rotating said shaft, and brake means for locking said shaft against rotation;

releasing said braking means and deactuating said motor means when said sand or soil is to be discharged, whereby the weight of said sand or soil urging said door open causes it to open gradually against the resistance produced by said helical groove means acting on said slidable body;

operating said motor means to close said door when said discharging has been effected; and

operating said breaking means when said door is to be held closed.

3,863,512

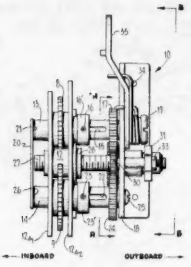
SHIFT MECHANISM FOR DERAILLEUR DRIVE

James W. Crawley, Woodland Hills, Calif., assignor to California Progressive Products, Inc., Manhattan Beach, Calif.

Filed Nov. 9, 1973, Ser. No. 414,146

Int. Cl. F16h *11/04*

U.S. Cl. 74—217 B **20 Claims**



1. In a derailleur gear changing mechanism including a main drive sprocket, a plurality of rear sprocket gears, and a connecting drive chain, a mechanism comprising:

a. means for laterally displacing said drive chain by means of power derived from the motion of said drive chain.

3,863,513

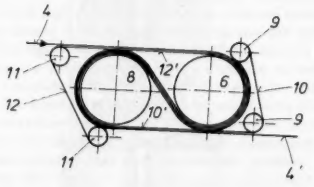
DRIVE UNIT FOR CONTINUOUSLY OPERATING SHEET PROCESSING OR TREATING LINES

Roland R. M. Schnettler, Hagen, Germany, assignor to Maschinenfabrik Sack GmbH, Duesseldorf-Rath, Germany

Filed Aug. 27, 1973, Ser. No. 392,100

Int. Cl. F16h *7/00*

U.S. Cl. 74—221 **2 Claims**



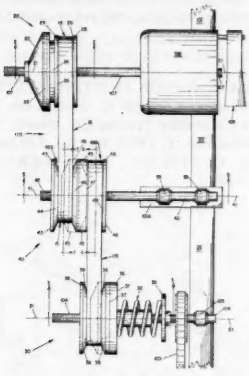
1. A tension roll assembly for regulating forward or back tension on a moving strip in strip processing lines comprising a pair of spaced first and second reversing rollers over which the strip is wound in an S-shaped configuration, and an endless belt winding means to increase friction between said strip and said reversing rollers, wherein said endless belt is guided initially in contact with the strip wound over said first reversing roller, then in contact with said second reversing roller and back over two spaced smaller guide rollers positioned in different radial planes of the first reversing roller, one of said guide rollers determining the back pass of said belt free of said first reversing roller.

3,863,514

BELT-DRIVE TRANSMISSIONS OF AMPLIFIED LOW/HIGH RATIO RANGE FOR SELF-PROPELLED SURFACE VEHICLES

Stanley W. Jensen, Omaha, Nebr., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Jan. 15, 1973, Ser. No. 323,901
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 A **5 Claims**



1. In a self-propelled surface vehicle having a variable speed engine including a throttle means therefor as the sole operator-controllable means for selectively controllably varying the engine-shaft "rpm" angular velocity and said vehicle also having underlying movable traction means, the improvement of a variable-ratio belt-drive transmission apparatus for said self-propelled surface vehicle and being capable of furnishing an unusually amplified low/high ratio range from the vehicle's said independently variable speed engine-shaft to its underlying traction means and comprising:

A. A variable-width driver-pulley adapted for co-revolvable installation with the variable speed engine-shaft, said driver-pulley including a pair of relatively transversely movable pulley flanges having non-parallel opposing faces which converge toward the driver-pulley transversely extending central axis, and means for automatically decreasing the flanges' transverse separation in response to increasing angular velocity for the engine-shaft,

B. An annular first-V-belt engaged both with the driver-pulley and the first-beltway of a uni-axial twinned-pulley;

C. Said uni-axial twinned-pulley having a transversely linearly extending pulley-shaft as the uni-axis thereof and spaced a substantially fixed constant distance from and parallel to the driver-pulley central axis, said twinned-pulley comprising a first-flange and a third-flange in surrounding and substantially axially stationary relationship along the pulley-shaft, a dual-faces second-flange positioned between the first-flange and the third-flange and in surrounding and transversely movable relationship along the pulley-shaft, opposing faces of the first-flange and the second-flange being non-parallel and converging toward the pulley-shaft to provide a first-beltway gorge therebetween to accommodate the said first-V-belt, the transverse position of the dual-faces second-flange being wholly dependent upon the selected angular velocity for the engine-shaft, and opposing faces of the second-flange and the third-flange being non-parallel and converging toward the pulley-shaft to provide a second-beltway gorge therebetween;

D. A variable-width driven-pulley adapted for co-revolvable installation with a jack-shaft which is actuatably connected with the vehicle traction means, said driven-pulley including a pair of relatively transversely movable pulley flanges having non-parallel opposing faces which converge toward the driven-pulley transversely extending central axis and said axis being spaced a substantially fixed distance from and parallel to the twinned-pulley uni-axis, and transversely yieldable biasing means normally tending to minimize the transverse distance between the two driven-pulley flanges; and

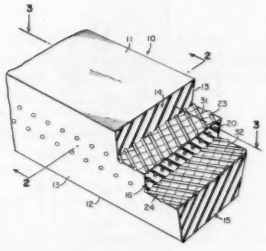
E. An annular second-V-belt engaged both with the driven-pulley and the second-beltway gorge of said twinned-pulley whereby as the second-V-belt pitch diameter on the interdependent pitches slave twinned-pulley increases it causes the movable flange of the driven-pulley to move against the yieldable biasing means and the second-V-belt diameter decreases thereat.

3,863,515

ENDLESS POWER TRANSMISSION BELT

Roger D. Meadows, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Apr. 19, 1973, Ser. No. 352,786
Int. Cl. F16g *1/00*
U.S. Cl. 74—231 R **13 Claims**



1. An endless power transmission belt comprising, a tension section, a compression section, and a load-carrying section arranged between said tension and compression sections, said load-carrying section having a longitudinally extending load-carrying cord, a first plurality of parallel cords arranged in skewed relation relative to and on one side of said longitudinally extending cord, and a second plurality of parallel cords arranged in skewed relation relative to and on the other side of said longitudinally extending cord, said skewed cords cooperating with said longitudinally extending cord to provide said belt having tensile strength and torsional stiffness as well as flexibility.

3,863,516

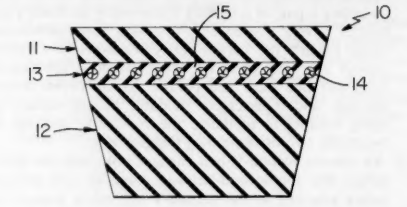
ENDLESS POWER TRANSMISSION BELT

David G. Fisher; Mark W. Krueger, and Clinton L. Bishop, all of Springfield, Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Oct. 11, 1973, Ser. No. 405,380
Int. Cl. F16g *5/16, 5/00*
U.S. Cl. 74—233 **11 Claims**

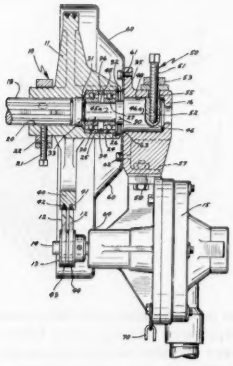
1. An endless power transmission belt comprising, a tension section, a compression section, and a load-carrying section, at least one of said sections being comprised of a poly (propylene oxide) rubber and a textile material, said poly (propylene oxide) rubber being blended with neoprene rubber to provide a rubber blend which adheres to said textile material with optimum adhesion, said rubber blend consisting of a blend

having poly (propylene oxide) rubeer therein which constitutes between 25 percent and 75 percent by weight of the total



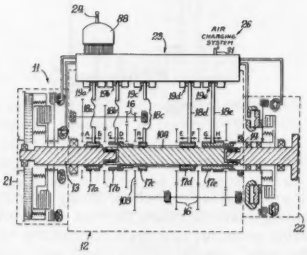
weight of the rubber blend, with the remainder of the blend being said neoprene rubber.

3,863,517
CENTRIFUGAL PUMP MOUNT
Ramon Pareja, Minneapolis, Minn., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Sept. 10, 1973, Ser. No. 395,579
Int. Cl. F16h *7/10*
U.S. Cl. 74—242.16 **5 Claims**



1. Drive belt tension adjustment means for controlling the belt coupling of a stationary drive shaft to a driven pulley and a relatively spaced rotary pump drive means and comprising:
a. drive pulley means having a peripheral belt receiving drive surface and adapted for mounting directly onto a stationary drive shaft and including a central hub with an axial bore extending therethrough with axially spaced and aligned bore segments forming concentrically arranged inner and outer housing segments, said bore being adapted to receive said drive shaft within the inner housing segment end thereof and arranging for rotation of said drive pulley with said drive shaft;
b. rotary pump means having a drive means disposed in spaced axial disposition from said drive pulley and having belt receiving drive means for engagement with a drive belt disposed upon said peripheral belt receiving drive surface, said drive pulley means and said pump drive means defining an belt occupying span therebetween;
c. annular bearing means disposed within said outer housing segment and arranged to receive an off-set camming adjustment shaft in journaled relationship therewithin;
d. off-set camming adjustment shaft means disposed within said annular shaft bearing means and having two axially spaced mutually eccentrically arranged segments in continuation, one with the other, the inner one of said segments being received within said shaft bearing means and with the other of said mutually eccentrically arranged segments extending axially outwardly therefrom;
e. cup housing means for said outwardly disposed off-set shaft segment mounted on the outwardly disposed segment of said off-set adjustment shaft, and including a shaft receiving bore and a radially extending arcuately adjustable lock means secured to said outwardly disposed segment for controllably adjusting and releasably retaining the arcuate disposition of said off-set camming adjustment shaft relative to the axis of said central hub; and
f. bracket means secured to said eccentric housing means for mountably receiving said rotary pump thereon.

3,863,518
TRANSMISSION SHIFTING SYSTEM
Philip S. Webber, and Joseph E. Goett, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Feb. 1, 1974, Ser. No. 438,667
Int. Cl. F16h *3/40, 3/22;* **F16d** *67/00*
U.S. Cl. 74—340 **10 Claims**

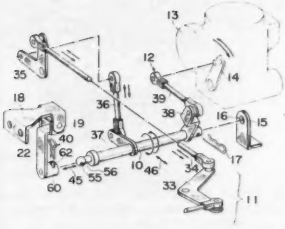


1. A drive transmission for coupling an engine to a driven load at any selected one of a plurality of drive ratios comprising; a plurality of coupling means for coupling selected sets of a plurality of gears, a plurality of shifting fork means for engaging said coupling means and shifting said coupling means for selecting desired gear drive ratios, actuator means associated with said shifting fork means for engaging said fork means and positioning said fork means and said coupling means, fluid pressure supply means, fluid communication means for connecting said supply means with said actuator means for actuation thereof, control means for controlling the flow of pressure fluid to said actuator means, said actuator means including a neutralizing actuator having mechanical means therein for automatically causing one of said shifting fork means to position an associated coupling means to disconnect said engine from said load when said fluid pressure drops below a predetermined value.

3,863,519
ROD-END BEARING ASSEMBLY FOR ACCELERATOR LINK MECHANISM
Sadaaki Natori, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan
Filed Mar. 22, 1973, Ser. No. 343,942
Claims priority, application Japan, Mar. 24, 1972, 47-29534; Mar. 24, 1972, 47-34648[U]
Int. Cl. G05g *9/00*
U.S. Cl. 74—474 **3 Claims**

1. A rod-end bearing assembly for the accelerator link mechanism of automotive vehicles comprising:
a shaft;
means mounting said shaft for movement in the axial direction and in a direction normal to the axis;

a first arm on said shaft;
an accelerating pedal;
first link means connecting said first arm to said pedal;
a second arm on said shaft and a lever to operate a throttle valve of an engine carburetor;
second link means connecting said second arm to said lever; said shaft having a ball head at an end thereof toward the side of the vehicle body with a narrower neck member connecting said ball head to said shaft;
a bracket secured to the vehicle body having a pivotable arm mounted on a pin held by said bracket;
a holder for said ball head fixed on one side to the lower end of said pivotable arm and having an opening on the other side for the insertion of said ball head;
said holder having a cavity therein connected by a bore to said opening on said other side of said holder;



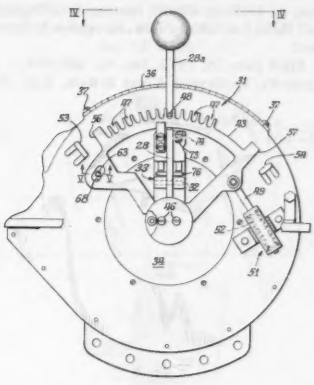
said bore having a slightly larger diameter than the outer diameter of said ball head and said cavity with connecting bore being spaced within said holder to enable said ball head and part of said neck member to be inserted within said holder;
a portion extending longitudinally through said holder from the tip of the opening to a depth at which the juncture of the neck member and said ball head is approximately placed when said ball head is inserted into said cavity;
a groove formed in said holder at the inner edge of said portion, said groove having a width equal to or narrower than the bore of said cavity, and
a check pin in said groove whereby said ball head is prevented from escaping from said cavity.

3,863,520
LIMIT MECHANISM FOR MANUAL SHIFT CONTROL LEVER

Kenneth R. Moline, Peoria; Maurice F. Franz, East Peoria, and Philip S. Webber, Morton, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 13, 1973, Ser. No. 369,714
Int. Cl. G05g *5/02, 9/08*
U.S. Cl. 74—475 **8 Claims**

1. A manually operable shift control mechanism for selectively establishing one of a multiplicity of speed ratios in a transmission, comprising
a shift control housing,
a shift control lever pivotably mounted on said housing for operating the transmission, said lever being angularly movable to a multiplicity of consecutively arranged settings, respectively corresponding to the transmission speed ratios. releasable means tending to engage said shift control lever in each of said multiplicity of settings,
limit means coupled with said lever, said limit means being operable to limit the number of consecutively arranged settings through which the lever may be angularly moved prior to engagement of said shift control lever by said releasable means,
override means operatively coupled with said limit means, said override means being selectively operable to override said limit means and permit substantially free angular movement of said lever through said multiplicity of settings, and

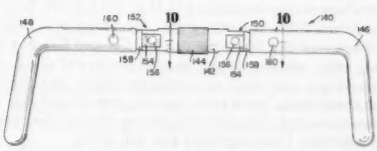


alternate limit means for varying the number of consecutively arranged settings through which the lever may be angularly moved during a selected speed ratio range of operation in the transmission.

3,863,521
ADJUSTABLE HANDLEBARS

Stephen L. Gatsos; Roy F. Abercrombie, and Charles R. Ford, all of Indianapolis, Ind., assignors to Carlisle Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 191,988, Oct. 26, 1971, abandoned. This application Feb. 2, 1972, Ser. No. 222,931
Int. Cl. B62k *21/16*
U.S. Cl. 74—551.4 **16 Claims**

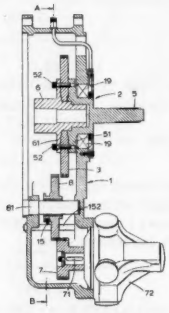


1. Adjustable handlebars for a bicycle comprising a central main body portion, hand-grip portions respectively at opposite sides of said main body portion, means for connecting each hand-grip portion to said main body portion for movement between a high-speed running position and a low speed resting position, and manually-operable means for releasably locking each said connecting means securely to hold its associated hand-grip portion alternatively in its running and resting positions, said connecting means including a first connector member at the adjacent end of said main body portion and a second connector member fixed to said hand-grip portion, said second connector member being engaged with and connected to the adjacent first connector member for generally rectilinear movement only relative to said first connector member between an inner position and an outer position, and pivot means for connecting said second connector member to said first connector member for pivotal movement, when said second connector member is in said outer position, between a lower position corresponding to said running position and an upper position corresponding to said resting position, said pivotal movement being about an axis extending forwardly in the direction of movement of said bicycle, said connector members being disengaged to permit such pivotal movement when said second connector member is in said outer position.

3,863,522
CHAIN TENSIONING DEVICES AND DRIVE ASSEMBLIES FOR MINING

John Gibson, 61 Welbury Grove, Newton Aycliffe, and James Nelson, 47 Briar Ln., Shiney Row, Houghton le Spring, both of England

Filed June 26, 1972, Ser. No. 266,309
Claims priority, application Great Britain, June 30, 1971, 30641/71
Int. Cl. F16h 37/06
U.S. Cl. 74—661 8 Claims



1. A chain tensioning device (CH or DH) in the form of a self-contained unit adapted to be interposed and interconnected between two components (e.g. CG and CJ) of a drive assembly for a mineral mining installation, one of said components having a stub shaft projecting therefrom and the other of said components having a socket into which said stub shaft is normally seated, said chain tensioning device comprising;

a. a housing (1) having front and rear sides;

b. a main shaft assembly (2) supported for rotation within said housing and interconnecting said two components, said assembly including;

i. a main gear wheel (3) disposed within said housing;

ii. a stub shaft part (5) projecting at least partially from the front side of said housing; and

iii. a socket part (6) having a socket opening towards the rear side of said housing;

said main gear wheel, stub shaft part and socket part being engaged so as to be rotatable together;

c. an auxiliary driving motor (72) mounted to said housing (1) and having a drive shaft (71) extending into said housing, said drive shaft (71) being spaced from and parallel to said stub shaft part (5);

d. a pinion (7) carried by said drive shaft (71) within said housing;

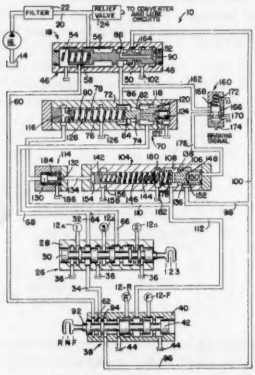
e. an intermediate gear wheel (8) disposed within said housing between said main gear wheel (3) and said pinion (7), said intermediate gear wheel having a first axial position engaging and drivably interconnecting both said pinion and said main gear wheel and a second axial position out of engagement with said pinion and said main gear wheel; and

f. means (121–124, 15) for shifting said intermediate gear wheel (8) between the two said positions.

3,863,523
HYDRAULIC SAFETY SYSTEM FOR A VEHICLE TRANSMISSION

James G. Starling, Peoria, and Harold A. Mathes, Tremont, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 25, 1973, Ser. No. 373,246
Int. Cl. F16h 57/10; F16d 67/04
U.S. Cl. 74—754 6 Claims



1. In combination with a transmission having a plurality of fluid pressure actuated drive conditioning devices including a first group of drive conditioning devices and a second group of drive conditioning devices, and wherein application of fluid pressure to at least one device of each group establishes a selected one of a plurality of drive conditions through the transmission, a control system comprising:

a source of fluid under pressure;

safety valve means having first and second positions;

a first selector valve communicating with said source with the safety valve means in its second position, and having a plurality of drive conditions for directing fluid to predetermined ones of said first group devices;

a second selector valve communicating with said source with the safety valve means in its second position and having a plurality of drive positions for directing fluid to predetermined ones of said second group of devices, and having a neutral position which cuts off fluid to all of said second group of devices;

the source of fluid pressure communicating with the first selector valve with the safety valve means in its first position only when the second selector valve is in its neutral position, to direct fluid to the predetermined one of the first group of devices;

the safety valve means being biased into its first position to initially direct fluid from the fluid pressure source to the predetermined one of the first group of devices only when the second selector valve is in its neutral position;

means for moving the safety valve means from its first to its second position upon buildup of fluid pressure in the predetermined one of said first group of devices;

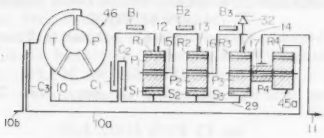
the movement of the safety valve means to its second position providing communication of the first and second selector valves with the source of fluid under pressure.

3,863,524

GEAR TRAIN ARRANGEMENTS

Yoichi Mori, Yokohama; Nobuo Okazaki, Chigasaki; Kunio Ohtsuka, and Tetsuya Iijima, both of Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 30,496, April 21, 1970, Pat. No. 3,701,293. This application Sept. 13, 1972, Ser. No. 288,553
Claims priority, application Japan, July 14, 1969, 44-55068
Int. Cl. F16h 57/10
U.S. Cl. 74—765 2 Claims



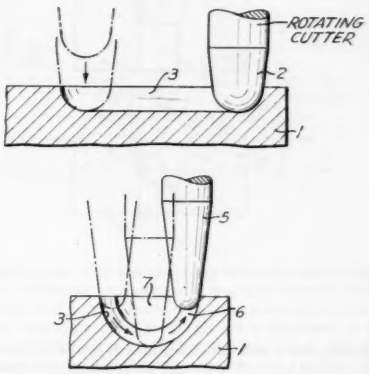
1. A gear train comprising:
an input shaft (10);
an output shaft (11);
a first planetary gear set (12) having a ring gear (R_1), a pinion carrier (15), a planet pinion (P_1) meshing with the ring gear (R_1) and rotatably journaled on the pinion carrier (15) and a sun gear (S_1) meshing with the planet pinion (P_1);
a second planetary gear set (13) having a ring gear (R_2) connected to the pinion carrier (15) of said first planetary gear set (12), a pinion carrier (16) a planet pinion (P_2) meshing with the ring gear (R_2) thereof and rotatably journaled on the pinion carrier (16) thereof and a sun gear (S_2) meshing with the planet pinion (P_2) thereof, the sun gear (S_2) of said planetary gear set being connected to the sun gear (S_1) of said first planetary gear set;
a third planeary gear set (14) having a ring gear (R_3) connected to the pinion carrier (16) of said second planetary gear set (13), a pinion carrier (17), a planet pinion (P_3) meshing with the ring gear (R_3) thereof and rotatably journaled on the pinion carrier (17) thereof and a sun gear (S_3) meshing with the planet pinion (P_3) thereof, the pinion carrier (17) of said third planetary gear set (14) being connected to said output shaft (11), the sun gear (S_3) of said third planetary gear set being connected to the sun gear (S_2) of said second planetary gear set;
a first clutch means (C_1) for engaging said input shaft (10) with the ring gear (R_1) of said first planetary gear set (12) during operation of reverse speed and fourth forward speed;
a second clutch means (C_2) for engaging said input shaft (10) with the sun gears (S_1, S_2, S_3) of said first, second and third planetary gear sets (12, 13, 14) during operation of first second, third and fourth forward speeds;
a first brake means (B_1) for anchoring the ring gear (R_1) of said first planetary gear set (12) during operation of third forward speed;
a second brake means (B_2) for anchoring the pinion carrier (15) of said first planetary gear set (12) and the ring gear (R_2) of said second planetary gear set (13) during operation of second forward speed;
a third brake means (B_3) for anchoring the ring gear (R_3) of said third planetary gear set (14) and and the pinion carrier (16) of said second planetary gear set (13) during operation of reverse speed; and
a one-way brake means (32) for preventing the ring gear (R_3) of said third planetary gear set (14) and the pinion carrier (16) of said second planetary gear set (13) from rotating in a direction opposing to the rotation of said input shaft (10).

3,863,525

METHOD OF MAKING A FORGING DIE

Roland E. Cale, Mt. Lebanon Township, Pa., assignor to Schaefer Equipment Company, Pittsburgh, Pa.

Filed Apr. 24, 1974, Ser. No. 463,741
Int. Cl. B21k 5/20
U.S. Cl. 76—107 R 3 Claims



1. In the method of making a forging die for forming on one end of a cylindrical rod-like member a projection shaped like part of a sphere spaced inwardly from the periphery of said member, the steps comprising moving a first rotating end-type milling cutter having a hemispherical lower-end down into a metal block to form a hemispherical recess therein, then moving the block at right angles to the cutter axis to cause the cutter to cut in the block a horizontal groove of predetermined length having horizontally curved end walls, removing the cutter from the block, positioning the lower end of a second downwardly tapered end-type milling cutter in one side of the groove near one end thereof, the lower end of the second cutter being hemispherical with a maximum diameter not exceeding about one-third of the maxiimum diameter of the hemispherical lower end of the first cutter, rotating the second cutter while maintaining it substantially in contact with the wall of the groove and simultaneously moving it downwardly in the groove and across it and up its opposite side, constantly repeating said movement of the second cutter across the groove as said block is moved lengthwise of the groove to slowly move said one end of the groove toward the second cutter to cause the cutter to cut into the curved end wall and form an arcuate shoulder, and forming another die block in the same way so that when the two blocks are placed together with their grooves registering a cylindrical die cavity will be formed having an end wall shaped like part of a shpere and spaced inwardly from the cylindrical side wall of said cavity by an annular shoulder formed from both arcuate shoulders.

3,863,526

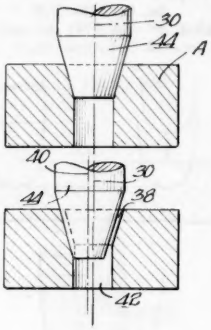
METHOD OF FORMING A DIE SECTION

Henry Anton Sygnator, Arlington Heights, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Division of Ser. No. 319,279, Dec. 29, 1972, Pat. No. 3,835,495. This application Aug. 5, 1974, Ser. No. 494,960
Int. Cl. B21k 5/20
U.S. Cl. 76—107 R 3 Claims

1. A method of forming a die section to be used in forming the entering portion of a cylindrical screw blank including the steps of providing a die section with a central bore, forming a

conical recess in the die section coaxial with the central bore, deforming the conical recess by engaging the recess with a



forming tool positioned along an axis laterally displaced from the central axis and to a depth greater than the conical recess.

3,863,527

MACHINE FOR PRODUCING OF BUCKLES, BUTTONS OR THE LIKE

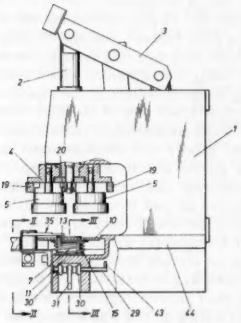
Rudolf Berning, Schwelm, Germany, assignor to Firma Astor-Werk Otto Berning & Co., Schwelm/Westfalen, Germany

Filed Aug. 30, 1973, Ser. No. 392,870

Claims priority, application Germany, Nov. 30, 1972, 2258649

Int. Cl. A44b *1/06*

U.S. Cl. 79—5 **4 Claims**



1. An apparatus for assemblying a button, comprising:

a housing;

an upper tool mounted on said housing and displaceable thereon;

a lower tool on said housing confronting said upper tool and adapted to receive a portion of a button to be formed in said tools, said lower tool including

an outer frame member,

spring means supporting said frame member for at least limited movement relative to said housing, said frame member being provided with an outer shoulder, and

a core piece received in said frame member and displaceable relatively thereto to lift a button from said frame member;

a pneumatic actuator on said housing for displacing said core piece to lift a button from said frame member;

a table removably mounted on said housing and having an opening receiving said frame member and engageable by said shoulder; and

an air-jet nozzle swingably mounted on said housing and normally overhanging said table and angularly displaced to clear said table for removable thereof, said nozzle training a jet of air against a button lifted from said frame member.

3,863,528

APPARATUS FOR ADJUSTING A TOOL SLIDE OF A MACHINE TOOL

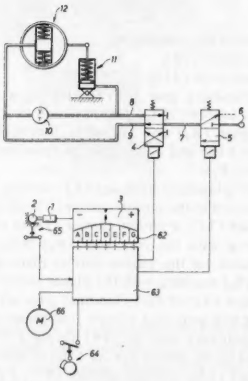
Franz Wiesner, Owen, Germany, assignor to Traub GmbH, Reichenbach/Fils, Germany

Filed Nov. 3, 1972, Ser. No. 303,341

Claims priority, application Germany, Nov. 26, 1971, 2158813

Int. Cl. B23b *21/00, 3/28*

U.S. Cl. 82—21 A **8 Claims**



1. An apparatus for adjusting the tool carriage of a machine tool in order to reproduce in a workpiece a dimension in accordance with a like dimension in a previously produced model workpiece, the apparatus comprising

means for sensing the dimension of a workpiece mounted in a machine tool, said means being initially adjustable to a null position with the model workpiece;

means responsive to said means for sensing, for producing a control signal representative of the deviation of the dimension in a subsequent workpiece from the model dimension;

an adjustable tool carriage;

means for stepwise adjusting said tool carriage;

a source of fluid under pressure; and

valve means coupled to said source and to said means for adjusting and responsive to said control signal for selectively providing fluid from said source to said means for adjusting,

said means for adjusting including

a driven member connected to said carriage and movable to incrementally move said carriage;

a driving member mounted for limited pivotal motion and actuated by fluid under pressure provided by said valve means; and

clutch means for selectively coupling said driving member to said driven member,

and wherein said driving member comprises

a pivotally movable body;

a piston and cylinder coupled to said valve means;

a fixed, non-rotatable body connected to said tool slide, said piston being operative against said fixed body to cause pivotal movement of said pivotally movable body from a first position to a second position when supplied with fluid under pressure from said source; and

spring means operative between said fixed and pivotally movable body to move the movable body from said second position to said first position when fluid pressure is removed.

3,863,529

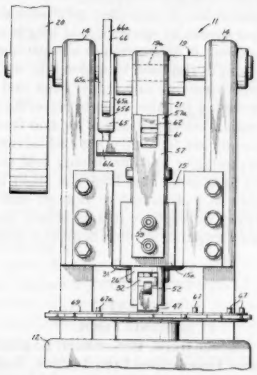
METHOD FOR TRIMMING CARTRIDGE CASES

Robert J. Bolen, Port Penn, Del., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Apr. 6, 1973, Ser. No. 348,488

Int. Cl. B23b *1/00;* **B23** *3/22;* **B21d** *51/54*

U.S. Cl. 82—47 **4 Claims**



1. A method of trimming a tubular casing having an open end portion with a trimming machine including a mandrel with an extended end and a cutting tool mounted for rotation around the mandrel, said method comprising the steps of rotating the cutting tool at a uniform speed, positioning a casing at a trimming site in axial alignment with the mandrel, moving the mandrel and rotating cutting tool toward the casing to position the extended end of the mandrel within the open end portion of said casing, moving the rotating cutting tool toward the extended end of the mandrel at a predetermined rate to sever a ringlet from the casing and hold the ringlet on the mandrel, removing the mandrel and rotating cutting tool from the casing, and moving the cutting tool away from the extended end of the mandrel to release the ringlet for gravitational removal from the mandrel.

3,863,530

DUCT BOARD CUTTER

Roger F. Weidman, 2100 S. West St., Wichita, Kans. 67213

Filed Nov. 26, 1973, Ser. No. 419,136

Int. Cl. B26d *3/06*

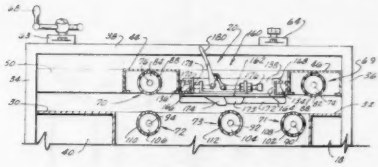
U.S. Cl. 83—5 **5 Claims**

1. A machine for forming a formation in a sheet of material, comprising:

a. a frame means having a stationary portion, a vertically movable portion and a means to move said vertically movable portion,

b. powered means mounted with said stationary portion of said frame means and said vertically movable portion thereof to move a sheet of material through said frame means between said stationary portion and said movable portion,

c. means mounted with said movable portion to removably mount a cutting tool said means to removably mount a cutting tool having an adjustable mounting means constructed and adapted to adjust the position of said cutting tool vertically relative to said vertically movable frame portion,



d. a cutting tool having a mounting means to removably mount said cutting tool with said means to mount a cutting tool, said cutting tool having when mounted a downwardly extending blade to in use cut a formation in a sheet of material as said sheet of material is moved through said machine by said means to move a sheet of material, and

e. said cutting tool mounting means has a latch means with a movable plunger constructed and adapted to in use mount said cutting tool in a fixed position with said means to mount a cutting tool.

3,863,531

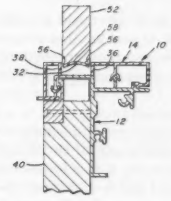
METHOD FOR FORMING HOLES

Robert H. Forschner, Apollo, and Robert J. Kushner, Creighton, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 26, 1974, Ser. No. 445,937

Int. Cl. B26d *3/00;* **B26f** *1/00*

U.S. Cl. 83—54 **6 Claims**



1. In the fabrication of a hollow article having a hole through a wall thereof comprising the steps of:

introducing a hollow article having substantially parallel walls and longitudinally extending support webs therebetween, between a supporting die and a punch having an anterior end with projecting corners and cutting edges around the periphery of the end between the corners angled with respect to die travel,

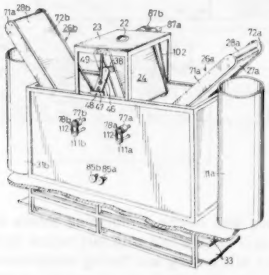
lineally displacing at least one of said die or punch to pierce a wall of said hollow article with the projecting corners on the punch in the area between the support webs in the article, and

continuing the lineal displacement of said die or punch to shear the wall of the article with the cutting edges of the punch to cut a hole through said wall.

3,863,532
SYSTEM AND METHOD FOR PROCESSING TEXTILE FIBERS

Kazue Konno, Odawara, and Yoshiji Kamekawa, Tokyo, both of Japan, assignors to Kabushiki Kaisha Nakagawa Seisakujo, Mil-ken, Japan

Filed Feb. 27, 1973, Ser. No. 336,199
Claims priority, application Japan, Mar. 3, 1972, 47-21993
Int. Cl. B26d *7/06*
U.S. Cl. 83—27 **16 Claims**



1. A method of preparing lengths of sliver of fibrous material comprising:

a. providing a sliver of fibrous material and a plurality of containers;

b. advancing said sliver of fibrous material in a longitudinal direction thereof;

c. delivering a length of said advancing sliver to one of said plurality of containers;

d. severing said sliver after said length of sliver has been delivered to said one container and retaining an end of said severed length of sliver, said retained end being a trailing end of said severed length of sliver;

e. delivering another length of said advancing sliver to another of said plurality of containers and simultaneously removing said severed length of sliver from said one container by advancing it in a longitudinal direction thereof so said retained trailing end is a leading end thereof;

f. severing said sliver after said another length of sliver has been delivered to said another container and retaining an end of said severed another length of sliver, said retained end being a trailing end of said severed another length of sliver;

g. delivering said advancing sliver to a different one of said plurality of containers and simultaneously removing said severed another length of sliver from said another container by advancing it in a longitudinal direction thereof so said retained end is a leading end thereof; and

h. repeating the steps of delivering a length of sliver to alternate ones of said plurality of containers, severing said sliver after a corresponding length has been delivered to a corresponding container and retaining a trailing end of said severed length of sliver, and removing the severed lengths of sliver alternately from said alternate ones of said containers by advancing said severed lengths in a longitudinal direction thereof so said retained end is a leading end thereof while delivering a length of sliver to an alternate of said containers.

4. An apparatus for preparing lengths of sliver of fibrous material comprising:

a. a feeder having a first and second operating position for receiving a sliver of fibrous material and advancing said sliver in a longitudinal direction thereof;

b. a first and second conveyor means cooperative with said feeder for receiving said advancing sliver from said feeder and advancing said sliver in a longitudinal direction thereof; said feeder and said first and second conveyor means comprising severing means for severing said sliver when said feeder is moved from one to the other of its said operating positions;

c. a first container and a second container disposed relative to said first and second conveyor means respectively for receiving said sliver advanced by said conveyor means;

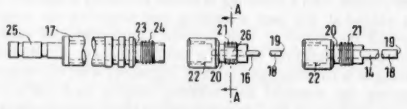
d. sensing means for developing a signal when a length of said sliver is contained in either one of said containers;

e. control means comprising drive means for positioning said feeder to said first operating position for delivering said sliver to said first conveyor means and for driving said first conveyor means to advance said sliver to deliver it to said first container, means applying said sensing means signal to said control means for stopping the advance of said sliver by said first conveyor means to said first container, said drive means comprising means moving said feeder from said first to said second operating position thereby severing said sliver and providing said sliver advanced by said feeder to said second conveyor means for delivering said advancing sliver to said second container, and means in said drive means for driving said first conveyor means to advance said length of sliver in said first container in a direction to remove said length of sliver therefrom in response to said sensor means signal, said drive means moving said feeder from said second to said first operating position thereby severing said sliver and providing said sliver advanced by said feeder to said first conveyor means for delivering said advancing sliver to said first container and for driving said second conveyor means to advance said length of sliver in said second container in a direction to remove said length of sliver therefrom in response to said sensor means signal indicating said length of sliver is delivered to said second container.

3,863,533
PUNCHING TOOL

Barry Anthony Lincoln Hurn, Beckenham, England, assignor to The Wellcome Foundations Ltd., London, England

Filed Mar. 8, 1973, Ser. No. 339,223
Int. Cl. B26f *1/24*
U.S. Cl. 83—100 **3 Claims**



1. A gel puncher comprising an outer pipe having a one end which has a gel cutting having an external diameter of from 1 to 10 millimetres; an inner pipe co-axially located within said outer pipe, said one end of said outer pipe projecting a predetermined distance of from 0.1 to 5 millimetres beyond a one end of said inner pipe; means for maintaining said pipes in stationary engagement relative to each other during operation of said gel puncher; said one end of said inner pipe having a transverse cross-sectional area of from 50 to 95 percent of a transverse cross-sectional area of said one end of said outer pipe; means located in said outer pipe enabling the passage of a gas from an external source into said outer pipe; means located between said inner pipe and said outer pipe enabling the passage of said gas within said outer pipe to said one end of said inner pipe, said means for maintaining said inner and outer pipes in stationary engagement relative to one another during operation of said device comprise an externally screwthreaded portion of said inner pipe, for screwthreaded engagement of an internally screwthreaded portion of said outer pipe, and wherein said outer pipe comprise a passage defined by said screwthreaded portion of said outer pipe and

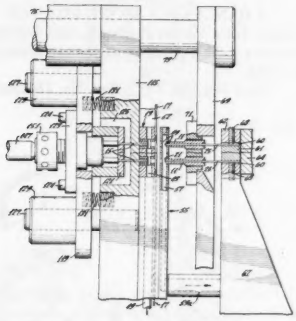
a depression extending along said screwthreaded portion of said inner pipe.

3,863,534

PRESS FOR PUNCHING MEMORY CORES

Eldred D. Scott, Tustin, Calif., assignor to Precision Sales Corporation, Reno, Nev.

Filed Oct. 1, 1973, Ser. No. 402,290
Int. Cl. B26f *1/02*
U.S. Cl. 83—126 **9 Claims**



1. A press for making parts from material comprising:

a die plate;

said die plate having first and second passages extending completely therethrough, one end of each of said passages defining a die;

said die plate having first and second passage sections therein intersecting said first and second passages at first and second intersections, said first and second intersections being respectively intermediate the ends of said first and second passages, respectively, said first and second passage sections opening at different locations on the periphery of the die plate;

tooling means including said dies for forming first and second parts from the material and positioning such parts at said first and second intersections, respectively, whereby said first and second parts can be separately removed through said first and second passage sections and separately collected; and

portions of the tooling means being received by the dies and portions of the tooling means being received through the other ends of said passages.

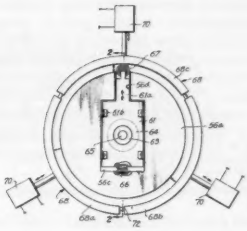
3,863,535

ROTARY SHEARING MACHINE

Masaji Hamano, 44-1, Takinogawa 6-chome, Kita-ku, Tokyo, Japan

Filed Feb. 5, 1974, Ser. No. 439,833
Claims priority, application Japan, Feb. 6, 1973, 48-16008; Dec. 18, 1973, 48-143614
Int. Cl. B26d *1/00*
U.S. Cl. 83—196 **15 Claims**

1. In a machine for shearing elongated workpieces such as bars, rods, or the like, stationary shearing means formed with an opening for receiving part of workpiece during shearing thereof, said opening extending along a given axis and said stationary shearing means having at one end a stationary shearing edge surrounding said axis, rotary shearing means located next to said one end of said stationary shearing means and formed with an opening for also receiving part of a workpiece during shearing thereof, said rotary shearing means having a rest position where said given axis extends substantially centrally through said opening of said rotary shearing means and said rotary shearing means having next to said one end of said stationary shearing means a rotary shearing edge which surrounds said axis in said rest position of said rotary shearing means, and means operatively connected with said rotary shearing means for rotating the latter around said given axis while simultaneously displacing said rotary shearing



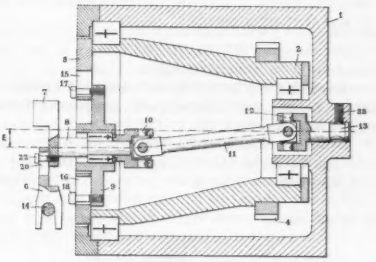
means transversely with respect to said given axis for increasing the eccentricity of said rotary shearing means with respect to said stationary shearing means while shearing a workpiece with said stationary and rotary shearing edges.

3,863,536

CUTTING GUIDE FOR MACHINES FOR PRODUCING RODS, PARTICULARLY FOR CIGARETTE MACHINES

Andre Legardinier, Plessis Bouchard, France, assignor to Usines Decoufle, Paris, France

Filed Sept. 7, 1973, Ser. No. 395,050
Claims priority, application France, Sept. 7, 1972, 72.31709
Int. Cl. B26d *1/56;* **B23d** *25/02*
U.S. Cl. 83—299 **5 Claims**



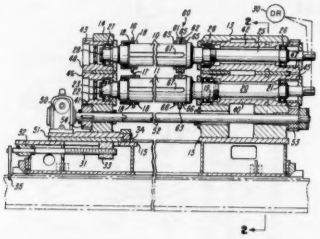
1. A cutting device moving while remaining constantly parallel to itself and perpendicular to a cigarette rod to be cut, said device turning about an axis at a uniform tangential speed equal to the speed of travel of the rod, comprising a fixed frame, a circular plate rotatably mounted in said frame, means driving in rotation said circular plate in said fixed frame, a first shaft perpendicular to said plate freely rotating in an eccentric bore provided in said plate, a cutting guide fixed at the outer end of said first shaft, a second shaft perpendicular to said plate in alignment with the axis of the plate and mounted to said frame, a third shaft and two universal joints connecting the respective ends of said third shaft to the inner ends of the said first and second shafts.

3,863,537

ROTATING LOCK FOR SLITTER APPARATUS

Charles E. Huelsman, Minster, Ohio, assignor to Stamco Division, The Monarch Machine Tool Company, New Bremen, Ohio

Filed Oct. 31, 1973, Ser. No. 411,446
Int. Cl. B23d *19/06*
U.S. Cl. 83—503 **8 Claims**



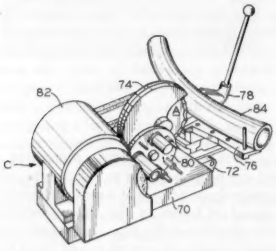
1. Web slitting apparatus of the character described comprising:
   a. a machine base,
   b. first rotatable arbor means having disk-shaped shearing blades mounted thereon,
   c. second rotatable arbor means having disk-shaped shearing blades mounted thereon,
   d. means on said base supporting said first arbor means for rotation and including means restricting one end of said first arbor means against axial movement with respect to said base,
   e. means on said base supporting said second arbor means for both rotationally and axial movement in parallel spaced relation with said first arbor means, said blades on said arbor means cooperating to slit a web traveling therebetween, and
   f. means forming a rotating lock connection between said arbor means establishing predetermined limits on the axial movement of said second arbor means with respect to said first arbor means.

3,863,538

ROTARY CUT-OFF KNIFE AND METHOD

Howard N. Behnke, San Gabriel, Calif., assignor to Wyle Laboratories, El Segundo, Calif.

Filed May 2, 1973, Ser. No. 356,612
Int. Cl. B23d *35/00;* **B26d** *3/16;* **B26b** *9/02*
U.S. Cl. 83—676 **11 Claims**



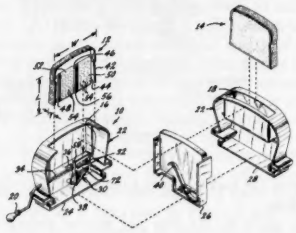
1. A rotary cutting knife comprising:
a generally circular knife body including a pair of opposed end faces and an outer peripheral edge, said peripheral edge comprising a continuous curvilinear configuration alternating between a plurality of radially disposed first portions radiused outwardly of the center transverse axis of said knife body and second portions radiused inwardly toward said center axis, said end faces converging toward each other adjacent said outer peripheral edge to define a continuous curvilinear cutting edge at said outer peripheral surface, the angle of convergence of said end faes at said first portions being different from the angle of convergence of said second portions; and, means for selectively mounting said knife to apparatus for rotating said knife about its transverse center axis.

3,863,539

CHANGEABLE MUSIC BOX TOY

Derek J. Gay, Palos Verdes Peninsula, and William H. Smedley, Torrance, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Aug. 28, 1972, Ser. No. 284,383
Int. Cl. G10f *1/06*
U.S. Cl. 84—94 **15 Claims**



14. A music box comprising:
a housing;
a music comb unit having a plurality of tines fixedly mounted in said housing;
interchangeable actuator means for cooperating with said music comb unit to play music;
each of said actuator means including a casing, an endless belt mounted in said casing around spaced shafts, said endless belt having appropriately positioned striking keys thereon, said casing having an opening at one end, and driven means within said casing adjacent said opening;
means for receiving one of said interchangeable actuator means adjacent said music comb unit;
and drive means mounted in said housing for driving said endless belt by engaging said driven means when said one actuator means is received in said receiving means and positioned adjacent said music comb unit so that said striking keys on said endless belt may pluck said tines.

3,863,540

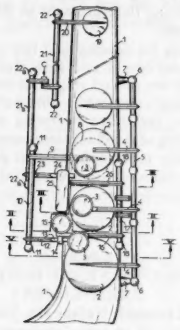
SAXOPHONE

Robert V. Carree, Mantes-la-Ville, France, assignor to Buffet Crampon, Paris, France

Filed June 18, 1973, Ser. No. 370,858
Claims priority, application France, Apr. 12, 1973, 73.13241
Int. Cl. G10d *7/08*
U.S. Cl. 84—385 **5 Claims**

1. A saxophone having a plurality of stops actuated by keys wherein the improvement comprises, a key disposed on a side of a saxophone having an integral first lever extending outwardly from said key, first mounting means for pivotally mounting said first lever at an end remote from said key, a stop having an integral second lever disposed on a side of a saxophone opposite said key, said second lever extending in a direction opposite the direction of said first lever, and second mounting means for pivotally mounting said second lever at an end opposite said stop, said second mounting means comprising a third lever coaxially mounted and commonly actuated

with said second lever and extending in a common direction with said first lever and having an end portion remote from



said second mounting means juxtaposed relative to said key, said key engaging said third lever in operation to pivot said second lever to actuate said stop.

3,863,541

BERYLLIUM BORIDE ARMOR

Carl F. Cline, Walnut Creek, and Mark L. Wilkins, Pleasanton, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 7, 1972, Ser. No. 224,239

Int. Cl. F41h *5/00*

U.S. Cl. 89—36 A **3 Claims**

1. An improved lightweight armor comprising a cermet selected from the group consisting of Be_2B and Be_4B bonded to a backup plate.

3,863,542

ASSEMBLIES COMPRISING AN AUTOMATIC FIREARM WITH A RETURN SPRING MOUNTED ON A SUPPORT

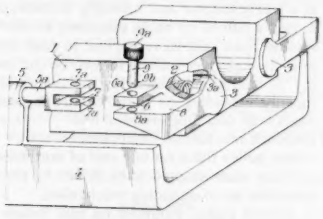
Bernard Pierre, Lyon; Rene Volle, and Raymond Koerper, both of Bourges, all of France, assignors to Etat Francais, Paris, France

Filed Sept. 24, 1973, Ser. No. 399,871

Claims priority, application France, Sept. 26, 1972, 72.33961

Int. Cl. F41d *11/24*

U.S. Cl. 89—37 GM **12 Claims**



1. An assembly comprising a support and an automatic weapon of open breech-block type, adapted to be mounted on said support, said weapon comprising a mobile breech-block subjected to the force of at least one return spring bearing via its rear end against a plug slidably mounted in the rear portion of the weapon breech box, characterized in that the bearing plug is fixed in relation to the weapon breech box and the weapon is fixed on its support by associating with each bearing plug of the return spring a detachable fixing member which, when the bearing plug of the return spring occupies its normal firing position and the weapon occupies its normal position on its support, is adapted to move through aligned apertures with which three separate attaching elements provided to this end are formed — i.e., a first element connected to the bearing plug, a second element connected to the weapon, and a third element connected to that member of the support to which the weapon is to be fixed, and further comprising a shock-absorbing apparatus with a mobile fitting interposed between the weapon and its support, characterized in that the attaching element associated with the weapon support is mounted towards the rear of said mobile fitting.

3,863,543

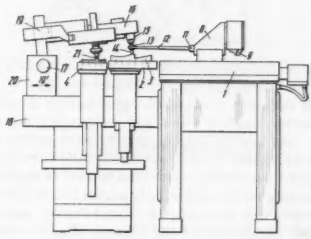
PATTERN TRANSMITTING DEVICES

Albert Bottcher, Scharzfeld Harz, and Hans Maass, Bad Lauterbert im Harz, both of Germany, assignors to Franz Kuhlmann KG, Harz, Germany

Filed Nov. 28, 1973, Ser. No. 349,444

Int. Cl. B23c *1/16*

U.S. Cl. 90—13 C **8 Claims**



1. In a pattern controlled machine having a tool movable in a plane and in a vertical feed direction perpendicular to said plane for three dimensional machining of a workpiece in accordance with a planar drawing and a contoured pattern, a pantograph including said tool and a tracer means operable to follow contours on said pattern and control motion of said tool in the vertical feed direction, pattern transmitting means comprising drawing reader means for automatically following the outline of said drawing, and guide means pivotally connected between said pantograph and said reader means for transmitting movements of said reader means to said tracer means to control the motion of said tool in said plane.

3,863,544

ENGRAVING AND COPY MILLING MACHINE HAVING A PANTOGRAPH

Rudolf Reeber, Neukeferloh; Peter Hofmeister; Heinrich Strobl, both of Munich, all of Germany, and Johann Muller, deceased, late of Unterhaching, Germany (by Katharina Muller, legal representative), assignors to Friedrich Deckel Aktiengesellschaft, Munich, Germany

Filed June 11, 1973, Ser. No. 369,052

Claims priority, application Germany, June 12, 1972, 2228575; Mar. 7, 1973, 2311149

Int. Cl. B23c *1/16*

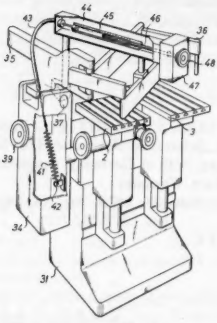
U.S. Cl. 90—13.1 **5 Claims**

1. An engraving and copy milling machine, comprising:

means defining a machine column;

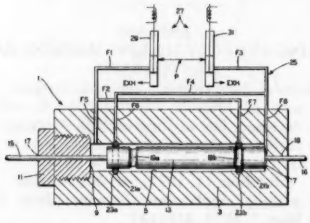
means defining a console mounted on said machine column means;

pantograph means including a tracer, said pantograph means being mounted on said console means;
support means for supporting said pantograph means for pivotal movement about a horizontal axis and for vertical movement;
a tool spindle and drive motor means for driving same;
worktable means mounted on said machine column means and including adjustment means for adjusting at least the height thereof;
adjustable pattern table means;
counterbalance spring means for balancing the weight of said pantograph means, said counterbalance spring



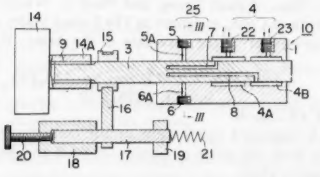
means including means defining a series connected sleeved wire and counterbalance spring;
means defining a swingable arm having a control panel mounted thereon within easy access of a machine operator, one end of said counterbalance spring being connected to said console means and the remote end of said sleeved wire being connected to said swingable arm; and adjusting means within easy access of a machine operator for effecting an operation of said sleeved wire and consequent adjustment of the tension of said counterbalance spring, said adjusting means including a hand wheel mounted on said control panel and operatively connected to said remote end of said sleeved wire.

3,863,545
POSITIONING DEVICE
Richard R. Kesti, Akron, Ohio, assignor to International Basic Economy Corporation, New York, N.Y.
Division of Ser. No. 196,979, Nov. 9, 1971, Pat. No. 3,735,781.
This application Mar. 14, 1973, Ser. No. 341,264
Int. Cl. F15b *15/26*; **F16k** *35/04*
U.S. Cl. 91—45 **4 Claims**



1. A rectilinear positioning device comprising:
a. a body including a bore;
b. a slide positioner reciprocable in said bore between two operating positions;
c. at least two elastic ring seals spaced along said bore and partially recessed into the periphery thereof, said seals having an unexpanded ring diameter substantially equal to or slightly less than the ring diameter of complemental detents or recesses on the slide positioner into which the seals are selectively seated;
d. first means for applying fluid pressure to said ring seals to contract and expand them in their respective recesses, and for applying fluid pressure to the ends of said slide positioner; and,
e. second means for causing said first means to selectively expand at least one of said seals into its recess and contract at least one of said ring seals into engagement with said slide positioner while simultaneously urging said positioner to the other operating position where said contracted ring seal will seat in a complemental detent on said positioner to immobilize said positioner such that, upon inactivation of said first or said second means, said slide positioner is restrained from movement.

3,863,546
CONTROL VALVE AND FLUID MOTOR ARRANGEMENT
Youichi Saida, Kawasaki; Hajime Ito, Yokohama, and Kojiro Imanaga, Tokyo, all of Japan, assignors to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha, Tokyo-to, Japan
Filed May 24, 1973, Ser. No. 363,338
Claims priority, application Japan, May 27, 1972, 47-62484; May 27, 1972, 47-62483
Int. Cl. F15b *9/10*
U.S. Cl. 91—375 R **1 Claim**



1. In combination,
1. a control valve for a rotary type hydraulic servo-actuating mechanism, comprising
a. a hollow casing with a portion of one end defined as a valve portion, and at the other end a portion defined as a manifold portion, said manifold portion having passage means adapted to be connected to the hydraulic servo-actuating mechanism, and said casing further having in the valve portion a pressurized oil feeding port and a pressurized oil discharging port, and
b. a spindle concentrically mounted in said hollow casing in a freely slidable and rotatable manner, said spindle having a pair of oil paths extending axially within said spindle from said valve portion to said manifold portion, long grooves spirally formed on the outer periphery of said spindle open to said valve portion, and radially extending oil paths connecting said axial oil paths with said long grooves; and
2. a feedback mechanism comprising
a. a first pulley fitted on one end of said hollow casing,
b. a rotary shaft adapted to be driven by the rotary type hydraulic servo-actuating mechanism,
c. a second pulley mounted on said rotary shaft, said second pulley being disposed in alignment with said first pulley, and
d. a belt tensioned between said pulleys, whereby the motion derived from the rotary type hydraulic servo-actuating mechanism is fed back to the control valve.

3,863,547

HYDRAULIC DRIVE FOR SWITCHGEAR

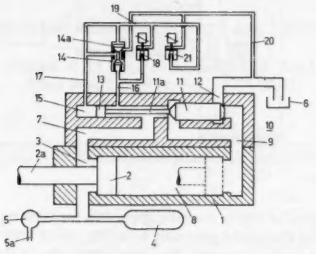
Arnold Meier, Wettingen, and Karl Trippel, Magenwil, both of Switzerland, assignors to BBC Brown Boveri & Co. Ltd., Baden, Switzerland

Filed Dec. 11, 1972, Ser. No. 314,259

Claims priority, application Switzerland, Dec. 13, 1971, 18042

Int. Cl. F15b *15/17, 15/22*

U.S. Cl. 91—416 **2 Claims**



1. A hydraulic drive for controlling switchgear comprising a main cylinder, a main differential piston slidable therein for controlling the switchgear, the opposed effective faces of said differential piston having different effective surfaces areas, a source of a pressure medium connected to one end of said cylinder to supply pressure to the smaller face of said differential piston, first closeable passage means connecting the opposed ends of said main cylinder, a main reversing valve for controlling flow of the pressure medium through said first passage means, whereby when said main reversing valve is open to permit the flow of pressure fluid to the larger face of said main differential piston, said main differential piston is moved in one direction, and a pressure relief port in said first passage means is opened when said main reversing valve closes said first passage means to permit reduction of fluid pressure against the larger face of said differential piston whereby said differential piston moves in the opposite direction, a second cylinder, a second differential piston connected to said reversing valve and slidably mounted in said second cylinder, the smaller effective face of said second differential piston being subject at all times to the pressure of the pressure medium, second passage means connecting opposed ends of said second cylinder, a control valve means disposed in said second passage means for controlling the flow of pressure medium in said second passage means to the larger effective face of said second differential piston, means for controlling said control valve means to actuate said main reversing valve, said main differential piston including an axial recess and a hollow needle valve means in communication with said first passage means and slidably disposed in said recess and cooperating therewith, said hollow needle valve means being fixed to said main cylinder, whereby said needle valve means is open to permit flow of the pressure fluid against the larger effective face of said main differential piston when said main differential piston moves in the one direction and closes when said main differential piston has moved in the opposite direction.

3,863,548

HYDRAULIC WHEEL

Bertrand Vachon, R.R. 3, Thetford Mines, Quebec, Canada

Filed Mar. 15, 1973, Ser. No. 341,544

Int. Cl. F04b *1/06*

U.S. Cl. 91—495 **1 Claim**

1. A hydraulic wheel comprising:

a fixed axle;

a wheel journalled on said axle;

a shaft eccentric to said axle extending slidably therethrough and keyed thereto against rotation;

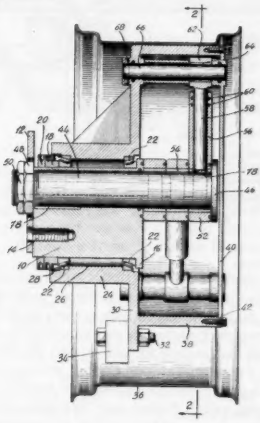
at least three cylinders each having a sleeve journalled on said shaft, all said sleeves being adjacent;

a piston in each cylinder, the outer ends of said piston being pivoted to said wheel at evenly angularly spaced points thereof;

a high pressure conduit and a low pressure conduit in said shaft;

ports communicating with said conduits and opening in respectively opposite sides of said shaft;

orifices in said sleeves connecting said ports to the interior of said cylinders;



a flange on an end of said shaft confining said sleeves between said flange and axle;

a nut threaded on said shaft for drawing said shaft and flange toward said axle;

sealing means between said flange and an adjacent sleeve, between said shaft and an adjacent sleeve and between adjacent sleeves;

said wheel comprising a hub journalled on said axle, a spoke section integral with said hub, an axial wall integral with said spoke section and a removable cover plate externally connected to said wall, said spoke section, wall and cover plate forming an enclosure containing said cylinders and pistons, the outer ends of said pistons being journalled on axial pins extending from said spoke section to said plate and removably supported at its opposite ends on said spoke section and plate, respectively.

3,863,549

GRIPPER-TRANSFER DEVICE FOR PLASTIC BAGS

Martin James Melin, Palos Hills, Ill., and Rodney Lee Wallace, Centerville, Iowa, assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 23, 1973, Ser. No. 353,916

Int. Cl. B31b *23/26*

U.S. Cl. 93—35 R **4 Claims**

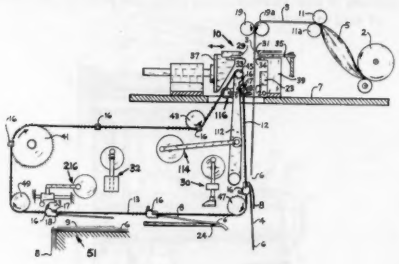
1. Apparatus for transporting a flexible web material having a first end and a second end, from a first machine station to at least a second machine station, which comprises in combination:

an endless conveyor having a first flight adjacent and juxtaposed to said first station and having a second flight adjacent and juxtaposed to said second station;

web foldover forming means mounted adjacent said first station, arranged and disposed to coact with a web grip-

per means said web foldover forming means comprising a plate-like member having a castellated edge;

web gripper means mounted on said conveyor adapted to coact with the castellated edge plate-like member of said web foldover forming means while closing to a web gripping position to form a foldover transversely across said web at a preselected foldover locus between said first and second ends of said web, to grip the folded over web through the castellation in the edge of the plate-like member of the foldover forming means, and to continue to grip said web at said foldover while maintained closed in said gripping position;



means for closing said web gripper means operably adjacent and juxtaposed to said web foldover forming means;

means for maintaining said web gripper means closed on a folded over web during its movement with said conveyor from said first station to said second station; and

means for opening said web gripper means operably adjacent and juxtaposed to said second station,

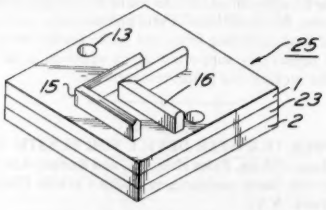
whereby said web is folded over and gripped intermediate said webs ends at said first station, is transported in folded gripped position to said second station, and is released at said second station.

3,863,550

CUTTING AND SCORING DIE

Albert J. Sarka, Fairview Park, Ohio, and Pierson S. Kang, Pennsauken, N.J., assignors to Chem Par Corporation, Montgomeryville, Pa.

Filed Mar. 19, 1973, Ser. No. 342,577
Int. Cl. B31b *1/20*
U.S. Cl. 93—58.3 **7 Claims**



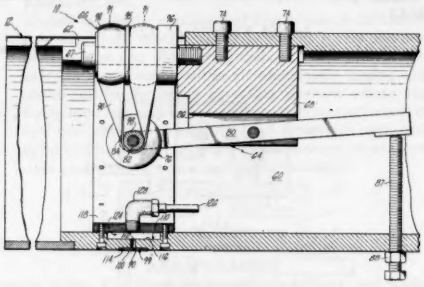
1. A cutting and scoring die comprising a superimposed pair of plates composed of substantially dimensionally stable material separated by an intermediate semi-rigid plastic material therebetween, said plates and plastic material having aligned slots therein extending from the outer face of one of said plates through the plastic material and into the opposed plate, each of said plates being substantially unitary and continuous except for said slots, and metallic rule members rigidly mounted in said slots and having their edges extending beyond the outer face of one of said plates.

3,863,551

TUBULAR ARTICLE FORMING APPARATUS

Robert H. Murphy, West Hartford, Conn., assignor to The Wiremold Company, West Hartford, Conn.

Filed Jan. 9, 1974, Ser. No. 431,688
Int. Cl. B31c *1/00*
U.S. Cl. 93—80 **8 Claims**



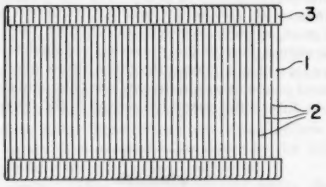
1. In a tubular article forming apparatus for forming a tubular article of elongated generally helically coiled material and having a mandrel assembly for supporting the material for forward movement along a generally helical path therearound for helically coiling the material into a tubular article, the mandrel assembly comprising an internal endless support belt for internally supporting the tubular article material, a support mandrel supporting the support belt for forward generally helical movement around the support mandrel along a generally helical path thereof from a first rearward point to a second forward point, and guide means for supporting and guiding the endless support belt from the forward to the rearward point of its helical path, the guide means and support mandrel supporting the endless support belt for unimpeded continuous movement generally helically around the support mandrel for supporting said material for forward movement along its generally helical path around the mandrel assembly, the improvement wherein the support mandrel has a generally helical peripheral support surface supporting the endless support belt along its said helical path, an air pressure supply system for supplying air under pressure, and air passageway means connecting the air pressure supply system to immediately above the helical peripheral support surface and under the support belt for supplying air under pressure as an air cushion under the support belt.

3,863,552

METHOD OF MAKING A VARIABLE-CONFIGURATION CONTAINER

Jose Jorba Gabarro, Rubio, 10, Igualada, Barcelona, Spain

Filed Mar. 6, 1972, Ser. No. 231,934
Claims priority, application Spain, Oct. 8, 1970, 384346
Int. Cl. B31b *5/00*
U.S. Cl. 93—94 R **2 Claims**



1. A method of making a variable-configuration container, comprising the steps of providing a sheet-material blank having two pairs of spaced opposite edges; forming in said blank

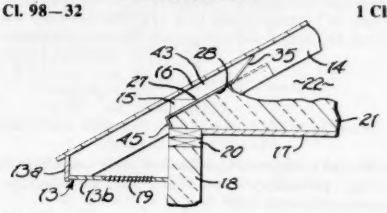
a plurality of folding lines extending between the edges of one of said pairs; securing to said blank along at least one edge of said one pair a strip of sheet material having a plurality of cut-outs; folding said blank along at least some of said folding lines and shaping it to the configuration of a tubular body having opposite open ends; and inserting end panels into said opposite ends so as to close the same, at least one of said end panels having a peripheral margin provided with projecting portions which are snapped into respective ones of said cut-outs.

3,863,553

COMBINATION INSULATION STOP AND VENTILATION BAFFLE

Bryce L. Koontz, 4915 Rogers Dr., Anchorage, Alaska 99507

Filed Dec. 20, 1973, Ser. No. 426,821
Int. Cl. F24f 7/00
U.S. Cl. 98—32 1 Claim



1. A combination insulation stop and ventilation baffle for mounting over an exterior wall and between a roof and ceiling of a building structure to provide a ventilation passageway to an air space between the ceiling and the roof and to prevent insulation which is subsequently applied to the ceiling from clogging said passageway, in which the exterior wall has a bearing plate on which ceiling joists and inclined parallel roof rafters are supported, said rafters being spaced from each other a first predetermined distance and said roof and bearing plate spaced from each other a second predetermined distance, said combination insulation stop and ventilation baffle comprising:

a body of stiff sheet material having (1) a length dimension between end edges greater than the second predetermined distance, and (2) a width dimension between side edges greater than the first predetermined distance;

said body having parallel side fold lines formed therein adjacent and spaced from the side edges defining side sections between the side fold lines and the side edges and a central section between the parallel side folds, in which the distance across the central section between the side fold lines is slightly less than the first predetermined distance to enable the side sections to be pivoted in the same direction relative to the central section and the body inserted between two rafters over the exterior wall at an inclined angle to the ceiling joist with the side section bearing against the rafters and one end edge engaging the bearing plate, the other end edge projecting into the air space to define a ventialtion passageway between roof rafters to the crawl space;

said body being scissile along said side fold lines, enabling slots to be formed therein extending inward from the other end edge with the distance between the slots being less than the first predetermined distance; and

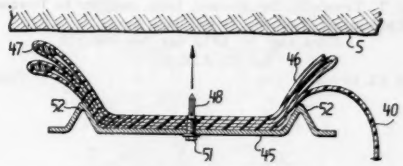
said body having an end fold line formed therein extending perpendicular between the side fold lines forming a flexible end tab which may be freely pivoted about the end fold line upward between the rafters relative to the central section to block one end of the ventilation passageway and prevent insulating material from passing into the ventilation passageway as the insulation is applied between the ceiling joists and which may be subsequently pivoted downward in the other pivot direction relative to the body central section to open said end of the ventilation passageway to permit a flow of air therethrough to the crawl space after the insulation has been applied between the ceiling joist.

3,863,554

PORTABLE MINE STOPPINGS

Newton A. Boyd, P.O. Box 872, Sophia, W. Va. 29521

Filed Sept. 5, 1973, Ser. No. 394,499
Int. Cl. F21f 17/00
U.S. Cl. 98—50 10 Claims



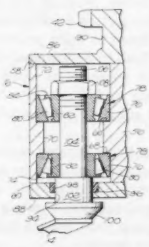
10. A portable stopping for blocking crosscuts in mine entries having roof, floor and side rib surfaces; comprising a sheet of fire-resistant, gas impervious flexible material adapted to be extended across a crosscut between the roof, floor and ribs thereof, a frame structure for supporting said sheet in substantially air-tight relationship between said surfaces, strap means carried by said frame and extending about the perimeter of said sheet adjacent said surfaces, continuous compressible sealing means positioned between said strap means and said surfaces, means for forcing said strap means toward said surfaces for compressing said sealing means thereby providing a substantially air-tight seal about the perimeter of said sheet, and wherein said sheet includes an excess of material over that which is required to extend across the crosscut, said excess being bi-folded upon itself adjacent one edge of said sheet, whereby said sheet may balloon out upon the occurrence of an extreme pressure differential to at least partially relieve the pressure.

3,863,555

VEGETABLE TOP SEVERING DEVICE AND BEARING BLOCK

Kenneth J. Duff, 4601 Margalo, and Jay W. Deatherage, 1920 Kathryn Ct., both of Bakersfield, Calif. 93309

Filed Jan. 30, 1974, Ser. No. 438,122
Int. Cl. A01d 23/04; B23d 25/02; B26d 1/56
U.S. Cl. 99—637 9 Claims



1. An improved cutter mechanism for a vegetable harvester having a plurality of double ended cutter blades, the improvement comprising:

a pair of double ended bearing blocks, each of which includes therein means defining a central bore upon a primary axis thereof, and a plurality of secondary bores equally spaced about said central bore;

a pair of inwardly directed tapered roller bearings retained in each said secondary bore;

a cutter blade support pin upon each end of each cutter blade, each said pin being positioned through one of said pairs of bearings in one of said secondary bores; and

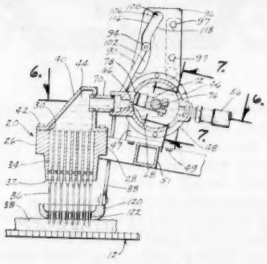
relatively adjustable securing means upon an end of each said pin engaging one of said bearings, whereby converging movement of said securing means causes said pair of bearings to be tightened both laterally and axially.

3,863,556

MACHINE FOR INJECTING FLUIDS INTO MEAT PRODUCTS

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Aug. 20, 1973, Ser. No. 390,079
Int. Cl. A22c *17/00*
U.S. Cl. 99—487 **17 Claims**



1. A machine for injecting fluids into meat products and the like, comprising,

a support means having a conveyor means movably mounted thereon, said conveyor means adapted to convey the meat product from one end thereof towards the other end thereof,

a fluid manifold movably mounted above said conveyor means and being movable between lower and upper positions with respect to the conveyor means, a first power means reciprocatably moving said manifold between its upper and lower positions,

said fluid manifold being fluidly connected to a source of fluid under pressure,

said fluid manifold having a plurality of injecting needles extending downwardly therefrom adapted to pierce the meat product thereunder when said manifold is in its said lower position,

valve means operatively connected to said fluid manifold and said fluid under pressure for selectively supplying said fluid to said injecting needles, said valve means being movable from closed to open positions, said valve means permitting said fluid to be supplied under pressure to said injecting needles when in its open position, said valve means preventing said fluid from being supplied under pressure to said injecting needles when in its closed position,

a meat product thickness sensing means adapted to engage the meat product being pierced by said injecting needles, valve control means operatively interconnecting said sensing means and said valve means for selectively opening and closing said valve means responsive to the thickness of said meat product,

said sensing means comprising an elongated plate means having opposite ends, the opposite ends of said plate means being vertically movably secured to opposite ends of said fluid manifold, said valve control means comprising a valve actuator rod secured at one end thereof to said plate means and extending therefrom, the other end of said rod being operatively secured to said valve means,

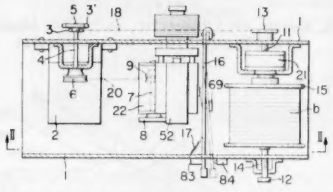
said valve means being secured to said fluid manifold for movement therewith, said valve means comprising a valve port and a valve member adapted to open and close said valve port, said valve actuator rod being operatively connected to said valve member.

3,863,557

STRAPPING MACHINE

Yukio Takahashi, Tokyo, Japan, assignor to Ikegai Tekko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1972, Ser. No. 277,596
Claims priority, application Japan, Aug. 9, 1971, 46-60064
Int. Cl. B65b *13/32*
U.S. Cl. 100—33 PB **9 Claims**



1. In a strapping machine for forming a strap loop in surrounding relationship to an object, such as a package, the improvement comprising:

a frame;

a press member movable supported on said frame for oscillatory movement between first and second positions;

a heater device for at least partially melting a plastic band, said heater device being mounted on and movable with said press member and positioned for melting said band at two locations; and

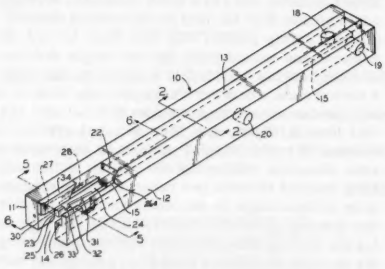
said press member including a pressing surface for engaging said band and for pressing said two locations of said band together.

3,863,558

WIRE TIE DEVICE

Cecil Dale Trumbo, 13122 Flint Dr., Santa Ana, Calif. 92705

Filed July 30, 1973, Ser. No. 383,773
Int. Cl. B65b *13/26*
U.S. Cl. 100—33 **10 Claims**



1. A wire tie device for use with a baling press upon connection to the upper platen of the baling press for holding and guiding one end of a length of bailing wire, having preformed loops at its ends, respectively, endwise with said one end foremost, into a knotting position and for holding and guiding the other end of the length of wire into an interengaged relation with the one end, when the platen is in baling position with respect to the material, so that the ends are drawn into a knot by the pull of the ends in the opposite directions by expansion of the baling material upon raising of the platen;

said device comprising a body having therein an elongated open inverted channel open at opposite ends and defined

by a top wall and depending side walls spaced apart laterally of the top wall, and a guide wall carried by one of said side walls and spaced below the top wall and extending transversely of the channel and terminating edgewise in laterally spaced relation to the other side wall, thereby providing a wire discharge passage;

said channel having a wire knotting station near one end; and

permanent magnet means carried by the body in laterally spaced relation to said one side wall and spaced from said passage in a direction toward the top wall, and operative while said one end of the wire is being fed loop end foremost to the knotting station to magnetically hold the portion of the length of wire which is between the loop of said one end of the wire and the other end of the channel in predetermined positions relative to the cross section of the body in which positions the wire is above and aligned with said discharge passage and spaced from said one side wall, and to hold the wire for movement of the wire endwise in opposite directions while it is in said predetermined positions.

3,863,559

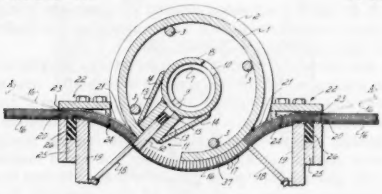
METHOD AND APPARATUS FOR DEWATERING FIBROUS MATERIALS

Edgar M. Pierce, 8200 Weller Rd., Cincinnati, Ohio 45242

Filed Aug. 16, 1972, Ser. No. 281,114

Int. Cl. A47j *19/02*; **B30b** *9/06, 1/00*

U.S. Cl. 100—37 **14 Claims**



1. A method for dewatering materials comprising confining the material to be dewatered between two surfaces one constituting a perforated screen, the two surfaces being spaced apart a distance of about ½ to ¾ of an inch whereby the dewatered material has a thickness of between ½ to ¾ of an inch, and pressing the material against itself in a direction parallel to the perforated screen at a press rate which decreases as the pressing continues, the pressure asserted on the material being about 300–3,000 psi, the water content of said dewatered material being reduced to below about 60 percent at a pressure of about 3,000 psi.

3,863,560

MACHINE AND PROCESS FOR SIMULTANEOUSLY EXTRACTING THE JUICE AND ESSENTIAL OIL OF CITRUS FRUIT

Paolo Indelicato, and Carmelo Indelicato, both of Via Finacchiaco, Aprile 110, Giarre, Catania, Italy

Filed June 26, 1973, Ser. No. 373,662

Claims priority, application Italy, Mar. 23, 1973, 67840/73

Int. Cl. A47j *19/02*; **B30b** *9/02*

U.S. Cl. 100—37 **7 Claims**

7. A process for simultaneously extracting the juice and essential oil of citrus fruit, comprising the step of

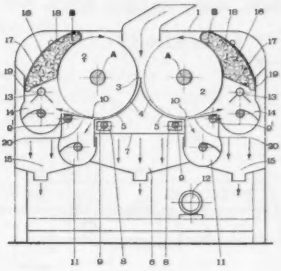
feeding the citrus fruit into a gap formed between a pair of parallel straight tubular cylinders mounted horizontally for rotation in opposite directions;

cutting the citrus fruit into two halves by a vertical cutting blade arranged in the gap between said pair of cylinders;

feeding, deforming and squeezing the cut citrus fruit halves along a progressively narrowing gap formed between the periphery of each of said cylinders and an adjacent perforated metal sheet;

allowing the juice of the cut citrus fruit halves to pass through said perforated metal sheet and collecting the juice in a basin;

cutting the membranes and mesocarp from the peels of the citrus fruit halves and collecting and discharging the cut membranes and mesocarp;



collecting and discharging the cut peels separately;

collecting the essential oil adhering to the peripheries of said cylinders by a pad of absorbent material arranged adjacent said cylinders and collecting the essential oil dripping from said pad of absorbent material in an exhaust channel.

3,863,561

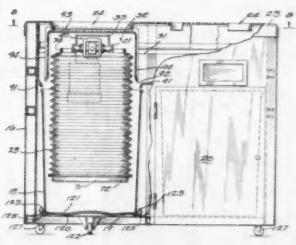
COMPACTOR

Robert F. Karls, Hales Corners, Wis., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 25, 1973, Ser. No. 354,430

Int. Cl. B30b *11/18*

U.S. Cl. 100—53 **11 Claims**



1. A top loading trash compactor comprising a low profile cabinet having two cubicles for trash containers therein, a cabinet top with two trash loading hatchways therein, one for each cubicle, said top being spaced above the containers to provide a ram shuttle way below the top and above the containers, a single ram, means mounting said ram in said shuttle way for shuttling movement from one cubicle to the other whereby when the ram is in one cubicle it is clear of the other cubicle to permit loading of trash into said other cubicle through its said hatchway, said ram having a ram platen and means for extending the ram platen deep into a trash container for compaction of trash therein and retracting said ram platen above the level of the container top and into said shuttle way for clearance of said containers during shuttling movement of said ram, and hatch cover means to close the hatchway above one cubicle in which the ram is working and open the hatchway above the other cubicle and permit trash loading

into said other cubicle concurrently with ram operation in the one cubicle.

3,863,562

MACHINE FOR CONTINUOUS BONDING OF FABRICS TO THERMOPLASTIC MATERIAL

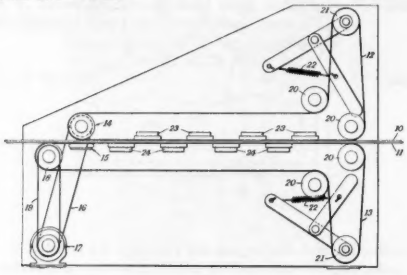
William Jack, West Kilbride, Scotland, assignor to Jax Products (Engineering) Limited, Kilwinning, Ayrshire, England

Filed Nov. 13, 1973, Ser. No. 415,299

Claims priority, application Great Britain, Nov. 15, 1972, 52749/72

Int. Cl. B30b *5/04, 15/34*

U.S. Cl. 100—93 RP **4 Claims**



1. A press for the continuous bonding of a layer of textile fabric to another layer embodying thermoplastic polymeric material, said press including a roller, means for rotating the roller, a flat resilient pad forming a nip with the roller, means for feeding the layers in superposition through said nip and means for heating the layers on their way to the nip.

3,863,563

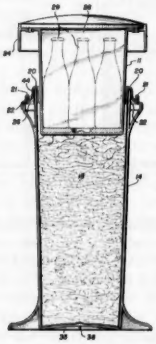
COMPACTOR

Samuel J. Popeil, Chicago, Ill., assignor to Popul Brothers, Inc., Chicago, Ill.

Filed Mar. 8, 1973, Ser. No. 339,401

Int. Cl. B30b *1/00*

U.S. Cl. 100—102 **10 Claims**



1. A compactor comprising, in combination,

a plunger member being hollow and having means at the upper end portion thereof for engaging a seat,

a seat proportioned for covering the upper end of said plunger and having means for removable engagement with said plunger, thereby exposing the hollow portion of the plunger,

said means for removable engagement including a bayonet-type lock means for removably locking said seat with said plunger member,

a tubular support member having a foot portion for resting on the floor and defining a hollow interior for collecting and compacting refuse, and whereby paper goods and other readily compressible refuse may be stored and compacted in the interior of the tubular member by the action of the plunger assisted by the weight of a person sitting on the seat, and by removing the seat portion of the plunger, access is had for the storage of bottles and other non-compressible refuse.

3,863,564

APPARATUS FOR CONVEYING AND STAMPING EGGS

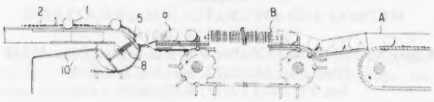
Koichi Higuchi, 7-9, 1 chome, Hyakkoku-cho, Kochi-shi, Japan

Filed Mar. 15, 1974, Ser. No. 451,549

Claims priority, application Japan, Sept. 10, 1973, 48-102331

Int. Cl. B41f *17/30*

U.S. Cl. 101—35 **3 Claims**



1. A device for automatically and continuously stamping eggs with an indicia to form a basis for judging the freshness of the eggs comprising in combination:

an intermittently moving conveyor means longitudinally extending in the horizontal plane whereby the vicinity of one end of said longitudinally extending conveyor means constitutes an egg stamping area; means for intermittently feeding eggs on an individual basis to said egg stamping area; an elongated frame member positioned longitudinally and in a substantial parallel manner adjacent to said conveyor means; a plurality of arm members fixedly supported at spaced intervals on said elongated frame member, each of said arm members arranged substantially at a right angle to said elongated member and having base and tip portions, the base portion being slidably associated with said conveyor means and the tip portion having an arcuate configuration to define a spoon-shaped section, said spoon-shaped section operatively propelling an individual egg from said egg stamping area; two rail members disposed substantially parallel to said conveyor means;

a lever member slidably supported between said two rail members and including a downturned tongue portion, said downturned tongue portion terminating in said egg stamping area and having an opening therethrough; and a spring pressed stamper member resiliently mounted within said opening and operatively stamping individual eggs intermittently being transferred to said stamping area by said intermittently feeding means.

3,863,565

APPARATUS FOR IMPRINTING ON MOVING ARTICLES WITHOUT SMEARING THE IMPRINT

Thomas E. Patykula, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 10, 1973, Ser. No. 423,550

Int. Cl. B41f *17/00*

U.S. Cl. 101—44 **9 Claims**

1. In a stamping machine for imprinting a distinctive mark on each of a series of articles sequentially delivered to and briefly dwelling at a selected location, such machine including a platen carrier actuated between a first initial position and a second imprinting position in response to each of a series of electric triggering impulses supplied to the machine, appara-

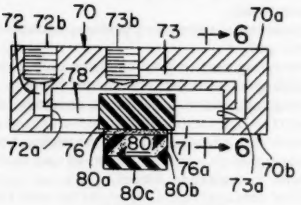
tus for modifying said machine to imprint a distinctive mark on each of a series of similar articles sequentially transported by a rapidly and continuously moving conveyor in a selected direction through a path of travel including an imprinting station in such path, such apparatus comprising, in combination;

I. a printing platen support member having a generally planar surface and embodying a longitudinal and relatively wide hole which opens through said surface;

II. a generally rectangular printing platen including a generally planar surface and of a substantially smaller length than the length of said hole in said platen support member;

III. means for supporting said printing platen within said hole in said platen support member for longitudinal sliding movement of such platen between first and second ends of such hole and with said planar surface of the platen paralleling said planar surface of the platen support member;

IV. a printing element having a first surface secured to said planar surface of said printing platen and a second opposite surface including thereon a printing type of a mark to be printed, such second surface extending beyond said planar surface of said platen support member;



V. means for supporting said machine at said imprinting station and adjacent said conveyor with said planar surface of said printing platen and said printing type of said printing element facing said path of travel of said articles and with the direction of said sliding movement of said printing platen within said hole in said platen support member being in alignment with said path of travel;

VI. means, responsive to the passage of each of said articles as they are respectively transported through said imprinting station, for supplying an electric triggering impulse to said machine;

VII. means, operating when said platen carrier is in its said initial position, for impinging pressurized fluid against a first end of said printing platen to move such platen in a first direction within said hole in said platen support member, such first direction of movement being opposite to said selected direction of transport of said articles by said conveyor; and

VII. means, operating during actuation of said platen carrier between its said initial position and its said second imprinting position, for impinging pressurized fluid against a second end of said printing platen to move such platen in a second direction within said hole in said platen support member, such second direction of movement corresponding to said selected direction of transport of said articles by said conveyor.

3,863,566

DRIVE AND REGISTRY CONTROL FOR ROTARY PRINTING PRESS

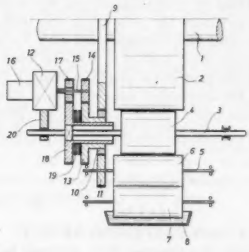
Klaus Schirrich, Bielefeld-Brake; Amir Erk, Bielefeld-Grossdornberg, and Ottomar Tessmann, Jollenbeck, all of Germany, assignors to Fischer & Krecke KG, Bielefeld, Germany

Filed Mar. 7, 1974, Ser. No. 448,576

Claims priority, application Germany, Mar. 12, 1973, 2312175

Int. Cl. B41f *13/12*

U.S. Cl. 101—248 **5 Claims**



1. In a printing machine having a central roller, a printing roller provided with a shaft and cooperating with said central roller, and an inking roller cooperating with said printing roller, a combination comprising a first gear having a diameter corresponding to that of said central roller and mounted for rotation with the same; a second gear mounted for rotation with said inking roller to rotate the same; a third gear meshing with said first and second gears to transmit motion to the latter one, said third gear having a diameter corresponding to that of said printing roller and being mounted on and freely turnable about said shaft; and a differential unit having an input gear train driven by said third gear, and an output gear train coupled with said shaft of said printing roller.

3,863,567

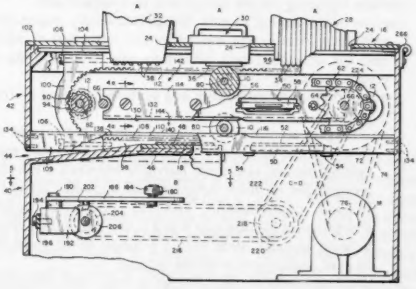
MULTILINE OFFSET PRINTING MACHINE

Dana B. Hastings, Natick, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Apr. 25, 1973, Ser. No. 354,316

Int. Cl. B41f *3/00*

U.S. Cl. 101—252 **21 Claims**



1. Printing apparatus comprising a supporting structure embodying a rigid horizontally disposed top part containing a plurality of longitudinally spaced openings, indicia bearing assemblies mounted on the top part in the openings with the indicia situated in a common plane at the under side of the top part, transversely spaced parallel conveyors supported on the

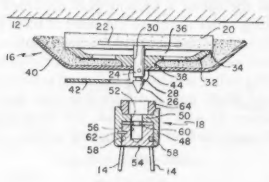
structure below the top part, said conveyors having longitudinally extending upper and lower runs, said upper runs being parallel to said plane of the indicia, a print platen and an ink pad supported on the structure adjacent the lower runs of the conveyors, ink and print rolls journaled at their ends between the conveyors for movement thereby relative to the ink pad, indicia and print platen, means for driving the conveyors to effect translational movement of the ink roll and print roll, means operable by the translational movement of the ink and print rolls to effect rotation about their axes, means for supporting that portion of the runs of the conveyors travelling along the upper runs at any time at a level such that the ink and print rolls have tangential engagement with the indicia, said means providing for lifting the ink roll as it is moved along the lower runs away from the print plate and then depressing it to a position of tangential engagement with the ink pad and for maintaining the print roll at a level to have tangential engagement with the print plate and then lifting it from the ink pad and means for delivering tickets from a strip of ticket material to present one ticket at a time to the print platen in timed relation with the arrival of the print roll at the print platen.

3,863,568

SUCTION FASTENING DEVICE

Arthur F. Frederick, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 27, 1972, Ser. No. 238,713
Int. Cl. B63f *3/02*
U.S. Cl. 102—13 **5 Claims**



1. A suction device for permanently fastening an object to a surface comprising:

suction inducing means attachable to said surface;

suction maintaining means for permanently maintaining said suction inducing means in said attached condition and for attaching said object to said suction inducing means including:

a suction cup maintainable in a suction inducing configuration;

an elongate stem having one end connected to said suction cup and the other end connectable to said maintaining means; said stem movable between a normally inoperative position wherein said suction cup is in a relaxed configuration, and an operative position wherein said suction cup is in a suction inducing configuration and said stem is in a position to be connected to said suction maintaining means;

a tapered camming surface formed at said other end of said stem;

a groove circumferentially formed adjacent said tapered end;

a first housing enclosing said suction cup and receivable of said stem; and

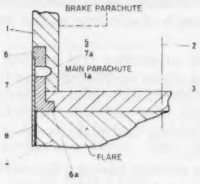
cam means pivotally associated with said stem for moving said stem between said normally inoperative position and said operative position.

3,863,569

SEPARABLE CONTAINER FOR PARACHUTE-TYPE FLARE

Bjorn Herman Olof Simmons, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed June 5, 1972, Ser. No. 259,985
Claims priority, application Sweden, June 11, 1971, 7576/71
Int. Cl. F42b *13/38*
U.S. Cl. 102—35.6 **6 Claims**



1. In a parachute-type flare adapted to be fired in a trajectory with a high rate of spin and including a means which is separated from a carrier part, with said means including a pyrotechnic flare portion and a tubular casing formed of a plurality of separable casing parts detachably secured to the flare portion and housing a parachute, the improvement in means for detachably securing said casing parts to said flare portion comprising:

means including a disc-shaped portion attached to said flare portion and

an annular ring portion encircling the ends of said casing parts lying adjacent said disc-shaped portion.

means engaging said ring portion to normally restrain said ring portion against longitudinal movement so as to maintain said ring portion in its said encircling position preventing radial outward movement of said casing parts in response to centrifugal forces,

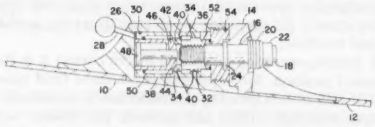
an annular container normally encircling said ring portion, said engaging means being responsive to removal of said annular container from its normal encircling portion to permit longitudinal movement of said ring portion relative to said casing parts to thereby free said casing parts for outward radial movement.

3,863,570

HYDRAULIC PRESSURE ACTUATED MISSILE STAGE SEPARATION

Harold W. Bixby, Encino, Calif., assignor to the United States of America, as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 15, 1974, Ser. No. 442,993
Int. Cl. F42b *15/10*
U.S. Cl. 102—49.4 **3 Claims**



1. A hydraulic pressure actuated device for separating stages of a missile during flight comprising: a first frame attached to one of the missile stages; a second frame attached to a second missile stage and provided with a housing chamber therein, an inlet in said second frame providing a pressure passageway to said chamber; a segmented nut in said chamber; a bolt connecting said first frame with said segmented nut, said bolt being provided with a collar for engaging the inner

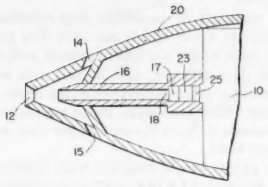
side of said first frame, said first and second frames being attached to each other when said bolt is connected to the segmented nut and said collar being disposed between said frames, and pressure actuated means for radially displacing segments of said nut to release the connection between said bolt and segmented nut and for exerting a thrusting force on said collar to force said stages apart.

3,863,571

FLUIDIC BATTERY ACTIVATOR

Carl J. Campagnuolo, Chevy Chase, and Allen B. Holmes, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 17, 1968, Ser. No. 745,950
Int. Cl. F42c *15/28*
U.S. Cl. 102—81 **5 Claims**



1. Apparatus for activating a battery in response to a fluid flow, comprising:

a. a resonant tube having an open end and a closed end;

b. a nozzle for directing said fluid flow onto said open end of said resonant tube to produce fluid compression waves therein; and

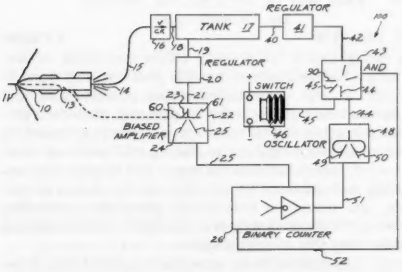
c. means responsive to heat produced at said closed end of said resonant tube by said fluid compression waves for initiating the activation of said battery.

3,863,572

FLUIDIC SAFING-ARMING SYSTEM

Carl J. Campagnuolo, Chevy Chase, and Charles F. Peer, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 24, 1966, Ser. No. 589,128
Int. Cl. F42c *5/00*
U.S. Cl. 102—81 **11 Claims**



1. In a weapon carrying missile powered by exhaust gasses an arming system, comprising:

a. means for receiving a portion of said exhaust gas;

b. means for receiving ram air;

c. a fluid amplifier supplied with a source of power fluid having a control conduit connected to said means for receiving ram air, said amplifier having first and second output conduits and including means to direct said power fluid out said first conduit in the absence of ram air and out said second output conduit upon the application of ram air to the system;

d. an AND gate having two input conduits and at least two output conduits; one input of said AND gate being connected to said means for receiving exhaust gas;

e. a fluidic oscillator having an input conduit connected to one of said output conduits of said AND gate so that said oscillator is rendered operative when exhaust gas only is applied to said AND gate;

f. a fluidic binary counter connected to said second output conduit of said fluid amplifier such that said counter is rendered operative upon the application of ram air to the system, and connected to an output of said fluid oscillator, the oscillations of which are counted by said counter;

g. means connecting said binary counter to the other of said inputs of said AND gate for directing a signal to said AND gate after said counter has counted a predetermined number of oscillations; and

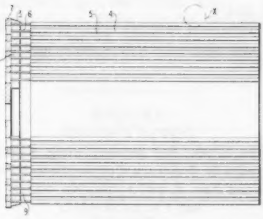
h. a pressure-activated switch for arming said missile connected to the other of said outputs of said AND gate so that it will receive a pressure signal upon the coincidence of input signals to said AND gate.

3,863,573

SOLID PROPELLANT CHARGE HAVING A SHORT BURNING TIME FOR ROCKET ENGINES

Heinz Dilchert, Steyerberg, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Postfach, Germany

Continuation-in-part of Ser. No. 874,881, Nov. 7, 1969, abandoned. This application Aug. 7, 1972, Ser. No. 278,389
Claims priority, application Germany, Nov. 9, 1968, 1808111
Int. Cl. F42b *1/00*
U.S. Cl. 102—101 **43 Claims**



1. A solid propellant charge for rocket engines having a short burning time comprising a plurality of spaced support layers arranged to together define a definite geometric shape in the direction perpendicular to said support layers, an adhesive layer attached to each support layer in such a way that each support layer is embedded in its respective adhesive layer, and a layer of propellant covering each side of each adhesive layer, the spacing of said support layers and the amounts of adhesive and propellant on said support layers being so selected that each propellant-covered layer is spaced from adjacent propellant-covered layers by substantially equidistant gaps, whereby loss of dimensional stability of said charge with increasing temperature and breakage of said charge with decreasing temperature are substantially prevented.

3,863,574

POWER SUPPLY FOR HIGH SPEED VEHICLES

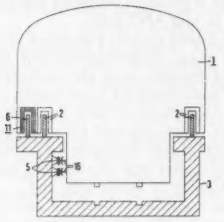
Johann Thomas, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munchen, Germany

Filed Feb. 6, 1974, Ser. No. 440,027

Claims priority, application Germany, Feb. 8, 1973, 2306292

Int. Cl. B60m 7/00

U.S. Cl. 104—148 LM 8 Claims



1. An apparatus for powering a vehicle above a predetermined speed which comprises;

a. basic power means including a source of primary power and at least one transmission means parallel to the path of said vehicle, for carrying said primary power along said path;

b. an additional power transmission means paralleling said path;

c. a plurality of converter means each positioned at approximately equally spaced intervals of predetermined distance along said path;

d. means for detecting when said vehicle has exceeded said predetermined speed;

e. means responsive to said speed detecting means for energizing at least one of said converter means such that said primary power transmission means is electrically connected to said additional power transmission means at that point in the vehicle path at which said vehicle is then located; and

f. means within said vehicles responsive to the power supplied to said additional transmission means, for powering said vehicle.

3,863,575

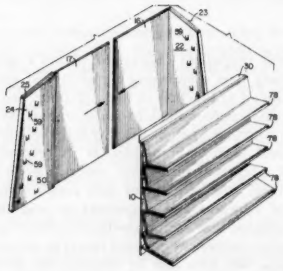
DISPLAY STAND

Roger R. Kuns, Clyde, and Nelson Orwig, Sandusky, both of Ohio, assignors to Westvaco Corporation, New York, N.Y.

Filed Nov. 8, 1973, Ser. No. 413,971

Int. Cl. A47b 43/02

U.S. Cl. 108—111 1 Claim



1. A display stand having a completely finished outer surface and consisting of a plurality of components prepared from separate blanks of material such as paperboard that are folded, arranged and secured to one another to result in a single integral unit for shipment to the user, said display stand when set up having an open frontal portion formed by a back panel, a pair of side walls foldably attached thereto and arranged at right angles to said back panel, a plurality of shelf panels each secured to said back panel along one edge thereof, and a plurality of shelf support elements locked in position between the side walls and arranged to lie beneath each individual shelf panel, the improvement wherein:

a. said back panel is of double wall construction and consists of a full sized inside back wall panel and a pair of left and right half-sized outside back wall panels which are adhered to the back of said inside back wall panel, each half-sized back wall panel including a pair of articulated inside side wall panels foldably attached along one edge thereof which are folded over about their articulated joint and adhered to one another to form a pair of side wall core elements;

b. said side walls are of quadruple wall construction and each consists of a pair of left and right two part outside side wall panels which are folded around and adhered to a side wall core element, said outside side wall panels further including abbreviated flaps at the upper and lower ends thereof which are folded inside and adhered to the side wall panels to form finished upper and lower edges for said side walls;

c. said shelf panels are of multiple wall construction and consist individually of a two-piece core element adhered together and an outside shelf panel structure, said outside shelf panel structure including a pair of upper and lower shelf panels which are folded around and adhered to each core element, a riser panel foldably attached to said upper shelf panel and a flap member foldably attached to said riser panel, said multiple wall shelf panels each being attached to the front of said inside back panel only along said flap member; and,

d. means is provided in said quadruple wall side walls for accepting and retaining the shelf support elements in different positions for adjusting the angularity of the multiple wall shelf panels while the lower shelf panel of each multiple wall shelf panel abuts against the inside back panel forcing the riser panel into its proper position when the angulation of the shelves is changed.

3,863,576

ADJUSTABLE SELF-LEVELING DISPENSER

Frank Christian Olsson, Eastlyme, Conn., assignor to AMF Incorporated, White Plains, N.Y.

Filed May 10, 1973, Ser. No. 359,075

Int. Cl. A47f 1/00

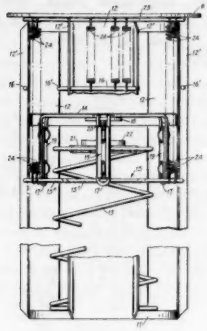
U.S. Cl. 108—136 6 Claims

1. A spring loaded self-leveling article dispensing device, comprising a hollow frame, a movable platform positioned in said frame, a large compression spring positioned in said frame beneath said platform for biasing said platform vertically upward, a plurality of small tension springs surrounding said compression spring for also biasing said platform vertically upward, means between the upper end of said compression spring and platform for adjusting the head load of said platform, and means for individually selectively connecting any number of said small springs to said platform for adjusting the self-leveling rate of said platform,

wherein said hollow frame comprises a cylindrical shape having an open annular top member, a circular bottom member, and spaced side panel members interconnecting the two, and means on said side panel members providing spaces thereon for storage of said small springs when not connected to said platform,

wherein said platform comprises a rigid wire cage structure having a top plate thereon, roller guide means on said

cage structure adapted to guide said cage structure along the inside surface of said side panel members, and said



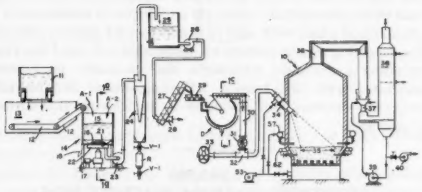
storage space being located along the outer surface of said side panel members.

3,863,577

FLUIDIZED BED REACTOR

Andrew B. Steever, Old Greenwich, Conn., and David Kelleher, Yonkers, N.Y., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Nov. 22, 1971, Ser. No. 200,994
Int. Cl. F23g *3/00*
U.S. Cl. 110—8 R **15 Claims**



1. A fluidized bed reactor for the combustion of waste, which comprises an upright housing,

a horizontal construction plate dividing the housing into a wind box chamber below, and a combustion chamber above said constriction plate, said constriction plate being adapted to support a bed of sand,

a stack gas connection for the reactor housing, discharging the combustion gases,

controllable means for supplying combustion air under pressure to said wind box chamber, effective to maintain said bed of sand in a state of fluidization,

a plurality of air jet devices mounted in the reactor wall, and provided with a controllable air pressure supply, said air jet devices being arranged so as to establish rotational turbulence in a zone of combustion adjacent to, and merging with, the top strata of the fluidized bed,

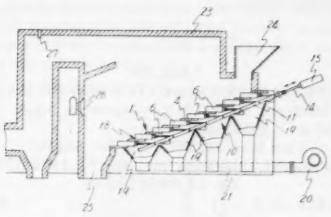
and feed means for supplying said waste material to said combustion zone.

3,863,578

INCINERATOR STOKER

Hisamitsu Kato; Masashi Yoshimura; Yoshitaka Takei; Akio Nishina, and Ryosuke Yamashita, all of Osaka, Japan, assignors to Hitachi Shipbuilding and Engineering Co., Ltd., Osaka, Japan

Filed Jan. 10, 1974, Ser. No. 432,244
Claims priority, application Japan, Apr. 18, 1973, 48-46817; Apr. 18, 1973, 48-46818; Jan. 29, 1973, 48-12730
Int. Cl. F23g *5/00*
U.S. Cl. 110—8 R **15 Claims**



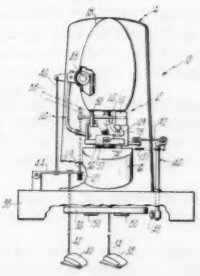
1. An incinerator stoker comprising a plurality of stepped stationary hearths having alternate horizontal step surfaces and vertical wall portions, openings provided in the vertical wall portions at suitable intervals widthwise of the stationary hearths, movable hearths having front end vertical portions and adapted to be moved in and out on the horizontal step surfaces through said openings, air holes provided in the front end vertical portions of said movable hearths and in the vertical wall portions of the stationary hearths between the movable hearths, and driving means for moving said movable hearths in and out.

3,863,579

SEWING MACHINE BUTTON LOCATING MECHANISM

John L. Rockerath, and Harold J. Schreck, both of Utica, N.Y., assignors to Jetsew, Inc., Barneveld, N.Y.

Filed May 1, 1974, Ser. No. 465,855
Int. Cl. D05b *3/22*
U.S. Cl. 112—113 **13 Claims**



1. In a sewing machine button apply installation having a sewing machine with a stitching station operable through a button apply cycle for sewing a button onto material thereat; and a button locating mechanism with a button guideway adapted to overly the material at the stitching station and operable for individually guiding buttons to and retaining them at the stitching station, a slide having a button locator engageable with a button in the guideway, the slide being shiftable from a first position to a second position for transferring a button along the guideway to the stitching station and back to its first position for engagement with a succeeding

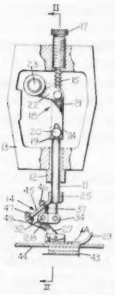
button in the guideway, manually operated means for lifting the button guideway to facilitate removal and insertion of the underlying material, and slide operating means for shifting the slide from its first to its second position for transferring the engaged button to the stitching station and for returning the slide to its first position for engagement with a succeeding button in the guideway, the improvement wherein the slide operating means comprises means coupling the slide to said manually operated means for automatically shifting the slide forwardly to transfer an engaged button to the stitching station in conjunction with lifting the button guideway with the manually operated means.

3,863,580

LOW-INERTIA PRESSERFOOT FOR SEWING MACHINES

Nerino Marforio, Milan, Italy, assignor to S.p.A. Virginio Rimoldi & C., Milan, Italy

Filed Mar. 22, 1973, Ser. No. 343,987
Claims priority, application Italy, Apr. 13, 1972, 23075/72
Int. Cl. D05b *27/04*
U.S. Cl. 112—212 **5 Claims**



1. For a sewing machine of the type including a needle plate and a feed dog for advancing a workpiece as it is sewn, an improved low inertia presser-foot device comprising:

a. a presser-foot bar having an axial bore extending therethrough;

b. support means including

1. a clamp member attached to one end of said presser-foot bar.

2. an oscillatable support having a bifurcated pivoting head pivotably connected to said clamp member with said sole plate being pivotably attached to the other end of said oscillatable support, and

3. a roller member mounted between the bifurcations of said pivoting head;

c. independent biasing means carried by said pressure-foot bar and operatively connected to said roller member for urging the sole plate toward the feed dog; and

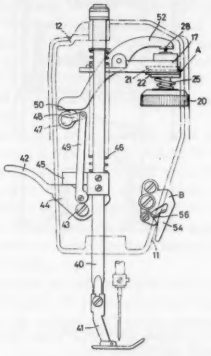
d. a fabric pressing spring with tension control means connected to said presser-foot bar for continuously urging the latter and the supporting means carried thereon under selected tension in a direction to effect contact of the sole plate with the workpiece as it is advanced by the feed dog.

3,863,581

THREAD TENSIONING DEVICE FOR SEWING MACHINES

Tadao Kohara, and Iwao Takahashi, both of Osaka, Japan, assignors to Maruzen Sewing Machine Co., Ltd., Osaka, Japan

Filed Sept. 4, 1973, Ser. No. 393,993
Claims priority, application Japan, Sept. 13, 1972, 47-107214; Oct. 13, 1972, 47-119017; Oct. 28, 1972, 47-113114
Int. Cl. D05b *47/00*
U.S. Cl. 112—255 **5 Claims**



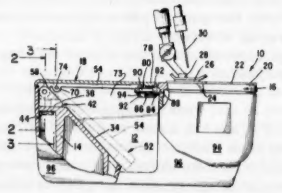
1. In a sewing machine including a vertical standard supporting a substantially horizontal upper arm having an upper surface and depending side and end surfaces, an upwardly opening first thread guide extending transversely of the upper surface of the arm fully between said side surfaces, a second thread guide formed at a forward side surface of said arm and intersecting and communicating with said first thread guide, a pair of cooperating spring biased thread tensioning discs contained below said upper surface and wholly within said arm and located in close proxto the point of intersection of said first and second guides, the thread engaging surfaces of said discs being substantially coplanar and disposed substantially in a horizontal plane with said first and second guides, and tension adjusting means operatively associated with said discs and including a manually adjustable dial co-axially operatively associated with said tension adjusting means and partially projecting outwardly of a window in the forward side surface of said arm.

3,863,582

CONVERTIBLE SEWING MACHINE BEDS

John Patricia, Elizabeth, and Alfred H. Mack, Bayonne, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,508
Int. Cl. D05b *73/10*
U.S. Cl. 112—258 **10 Claims**



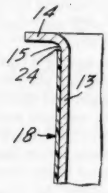
1. In combination with a sewing machine having a base with a work supporting bed including an elongated longitudinal arm having a primary work supporting surface for disposition

of materials to be sewn, support means having a first end portion and a secondary work supporting surface, said support means being mounted to said base for movement in a first direction for disposition of said support means in a first limit position wherein said secondary work supporting surface is substantially continuous with the primary work supporting surface of said elongated arm, said support means being movable in a first reverse direction opposite said first direction to a second limit position wherein the secondary work supporting surface is discontinuous from the primary work supporting surface of said elongated arm, said support means and said base further including means for effecting simultaneous movement of said support means in a second direction substantially normal to said first direction as said support means is moved in said first direction such that a clearance space is maintained between the first end portion of said support means and said base during movement of said support means in said first direction, said combination further including pivot means joining said support means to said base for pivotal movement of said support means in said first direction, and wherein said support means is slidably mounted on said pivot means for longitudinal movement of said support means in said second direction as said support means is pivoted in said first direction.

3,863,583
METHOD OF APPLYING LABEL TO TUBULAR CAN BODY

Irving Nerod, Wayne, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Aug. 2, 1973, Ser. No. 385,150
Int. Cl. B21d *51/26*
U.S. Cl. 113—120 A **3 Claims**



1. A method of applying a label to a tubular can body which comprises:

outwardly flanging the marginal end portions of a tubular can body to form radii of curvature between the flanged marginal end portions and the can body wall,

applying the label to the flanged can body wall, the label being selected to be of a size that covers the can body wall and that extends substantially to the radii of curvature, and

during the applying step, using the radii of curvature to guide and properly align the label onto the can body.

3,863,584
COMBINED HYDRAULICALLY OPERATED SNORKEL INDUCTION MAST AND HEAD VALVE

Richard S. Wilkins, Lyme, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 9, 1974, Ser. No. 459,432
Int. Cl. B63g *8/06, 8/36*
U.S. Cl. 114—16 D **3 Claims**

1. An improved snorkel system for submarine boats of the kind having:

a snorkel-mast,

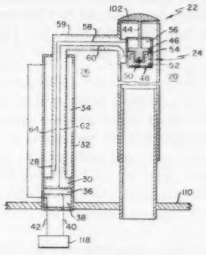
a snorkel-mast head-valve situated at the top of said mast;

a hydraulic piston assembly to operate said head-valve having:

a piston-shaft connected at one end to said head-valve and connected at its other end to a piston-head movable within a piston cylinder,

said piston-head having upper and lower piston-head surfaces forming separate upper and lower chambers within said piston cylinder into which chambers operating fluid is adapted to pass in order to move said piston-head and operate said head-valve,

a hydraulic-type snorkel-mast hoist located externally of said snorkel-mast and attached thereto to raise and lower said snorkel-mast and said head-valve, said snorkel-mast hoist having



a mast-hoist piston shaft connected to one end to said snorkel-mast and connected at its other end to a mast-hoist piston head movable within a mast-hoist piston cylinder,

said mast-hoist piston head having upper and lower piston-head surfaces forming separate upper and lower chambers within said last piston cylinder into which chambers operating fluid is adapted to pass in order to move said mast-hoist piston-head,

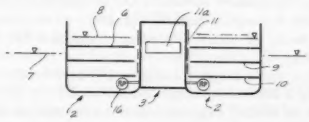
characterized in that there is provided:

a hydraulic-type fluid supply system communicating with said hydraulic piston assembly through passageways within said snorkel-mast hoist.

3,863,585
MARINE CARGO VESSEL

Louis Antoine Vernede; Leopold Nitzki, both of Bremen; Heinrich Liedke, Bremen-Osterholz, and Friedrich Schror, Bremen, all of Germany, assignors to Aktiengesellschaft "Weser", Bremen, Germany

Continuation-in-part of Ser. No. 138,951, April 30, 1971, Pat. No. 3,835,802. This application Feb. 13, 1974, Ser. No. 442,138
Claims priority, application Germany, May 2, 1970, 2021653
Int. Cl. B63b *35/44*
U.S. Cl. 114—43.5 **7 Claims**



1. A marine cargo vessel, comprising hull means having an inside, an outside and a waterline to which it is submerged in an ambient body of water; deck means located inside said hull means and at least in part constructed as floodable basin means located at a level different from that of said waterline;

means defining a floodable upright shaft in said hull means and extending through said deck means; gate means at the level of said waterline and said deck means for communicating the interior of said shaft with said ambient body of water and with said basin means, respectively; and means for raising and lowering the level of a body of water in said shaft between the level of said waterline and the level of said basin means, whereby to permit conveyance of floatable containers by flotation between said waterline and said basin means and vice versa.

3,863,586

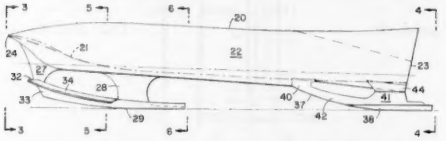
HYDRO-SKI BOAT STRUCTURE

Louie Deprez Hargett, 743 Nellie Ave.; Ellis Rose, 327 Baldwin St.; Aught Boone Dial, Shoals Acres; Jewel Rose, Executrix of said Ellis Rose, deceased, all of Florence, Ala. 35630

Filed July 28, 1971, Ser. No. 166,943

Int. Cl. B63b *1/20*

U.S. Cl. 114—66.5 H **2 Claims**



1. A hydro-ski boat structure of the character described, comprising, in combination:

an elongated substantially rectangular hull, in lateral section characterized by a concave bottom curvature, said curvature starting at zero at the bow and increasing to its maximum in proximal relation thereto and thence decreasing progressively to a substantially flat stern, the longitudinal curvature starting as concave at the bow, changing thereafter progressively to convex and decreasing to zero at the stern;

forward and rearward hydro-ski support members affixed to the bow and stern sections of said hull;

said ski members having a plurality of inner and outer planing surfaces planing during the forward movement of said hull through a body of water from zero speed through acceleration, to cause said hull to emerge from the water through alternating consecutive inner and outer planar action to support said boat structure on such planing surfaces at maximum propelled speeds at an optimum of minimum contact area on the surface of the water;

said forward hydro-ski member inner and outer planing surfaces comprising secondary and primary surfaces consisting of:

a first inner secondary surface (**31**) having a relatively high angle of incidence with said body of water affording accelerating lift to said structure;

a second inner secondary surface (**30**) in rearward spaced relation to said first surface having an angle of incidence in relation to said body of water and ski member to provide continued lift to said member to cause the same to emerge from the surface of the water;

an outer secondary surface (**33**) in lateral relationship thereto, having a relatively high angle of incidence with said body of water, affording continued lift to said member;

a primary outer planing surface (**29**) rearwardly thereof having a decreasing angle of incidence from its forward tip to its trailing edge such as to cause said ski member at maximum speed to plane on the minimum area of its trailing edge; and

a final inner secondary surface (**35**) in spaced relation to said primary surface, and laterally in relation thereto, having an angle of lateral incidence with respect to the water such as to cause the planing action of said ski member to be retarded in braking resistance when said boat structure is propelled into a turn.

3,863,587

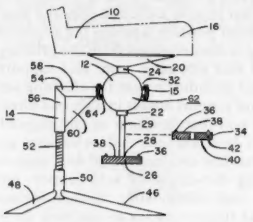
SELF-LEVELING AND SWIVELING CHAIR

Angelo J. Bosnich, 514 Dumaine St., New Orleans, La. 70116

Filed Feb. 25, 1972, Ser. No. 233,386

Int. Cl. B63b *29/12*

U.S. Cl. 114—191 **1 Claim**



1. A self-leveling and swiveling chair having a seat for a sitter and comprising:

a. a shaft having oppositely disposed ends and fixed by one of said ends to said seat with the other free end depending;

b. a stand having radially extending feet for engaging a deck of a ship; a tapped sleeve joining adjacent ends of said feet and forming therewith a base; a straight threaded shaft having oppositely disposed ends one of which ends is adapted to be threadably engaged in said tapped sleeve for varying the length of said threaded shaft engaged in said tapped sleeve; a dog leg sleeve having two hollow legs, one of said legs being reversely tapped with respect to said tapped sleeve and adapted to threadably engage said threaded shaft for varying the length of said threaded shaft cooperatively with said tapped sleeve when said threaded shaft is rotated;

c. universal joint means having a ball and socket joint, said ball being mounted on said shaft between said seat and a counterbalancing weight and above the center of gravity of the swiveling chair, and said socket being mounted on said stand and adapted to engage said ball for relative movement therebetween about three axis of motion;

d. a flat weight base fixed to the free end of said shaft for at least counterbalancing the weight of said seat when empty;

e. and a plurality of flat weights for adding to said weight base for counterbalancing the weight of a sitter, each said weight having a curved radial slot defined therethrough that is adapted to engage around said shaft, said curved slot extending from a closed end at said weight's center and extending to an open end on its periphery with said open end being angularly offset from said closed end, each said weight being separately engageable radially on said shaft through the open peripheral end of said curved slot and being turned about about its axis normal to said slot to bring said shaft to the closed center end of said curved slot, whereby said weights are added from the side to the shaft in vertical formation and prevented from slidably disengaging therefrom inadvertently by the angular offset of the open and close-ends of said curved slots.

3,863,588

LOOP DEVICE FOR MOUNTING ON BOAT

Herman L. Gillespie, 2415 Dellwood Dr., Fort Wayne, Ind. 46803

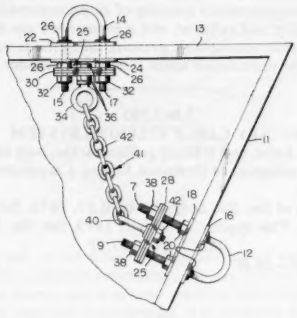
Filed Sept. 17, 1973, Ser. No. 397,989

Int. Cl. B63b *21/04*

U.S. Cl. 114—218 **10 Claims**

1. A device for mounting on a boat and providing at least one loop for engagement by a hook, said device comprising: a first bow eye having legs adapted to extend through the deck of the boat, nuts for threading on the legs for connecting the

bow eye to the deck, a tension member, first means connecting one end of said tension member to said first bow eye legs inside the hull of the boat, a second bow eye having legs adapted for extending through the boat and further nuts for theading on the legs of said second bow eye to connect the



said bow eye to the boat, second means connecting the other end of said tension member to said second bow eye legs inside the hull of the boat whereby a tension load imposed on a bow eye outside the boat will be borne, at least in part, by said tension member.

3,863,589

FENDER SYSTEM

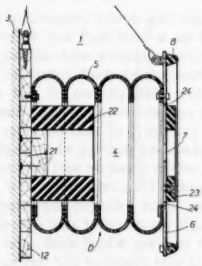
Paul Francois Guienne, Paris, and Jacques Francois Robert Prouhet, Les Clayes-sous-Bois, both of France, assignors to Bertin & Cie, Plaisir, France

Filed June 11, 1973, Ser. No. 368,742

Claims priority, application France, June 14, 1972, 72.21372

Int. Cl. B63b *21/04*

U.S. Cl. 114—219 **9 Claims**



1. In a fender device having a backing plate and a flexible wall fitted at one end thereof to said backing plate and projecting therefrom to another end to bound a deformable hollow chamber bottomed by said backing plate and collapsible by crushing of said wall towards said backing plate, the improvement comprising a resilient deformable generally cylindrical sleeve housed within said hollow chamber in spaced relationship with said wall thereof with a peripheral clearance being left between said sleeve and said wall for the entire length and periphery of said wall, said sleeve being fitted to said backing plate and projecting therefrom to end short of said another end of said wall.

3,863,590

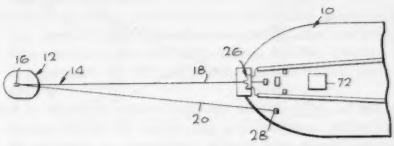
AUTOMATIC MOORING SYSTEM

Robert D. Karl, Pacific Palisades; Thomas D. Stearns, Saugus, and Ian B. Engh, Woodland Hills, all of Calif., assignors to Imodco, Inc., Los Angeles, Calif.

Filed Jan. 14, 1974, Ser. No. 433,220

Int. Cl. B63b *21/00*

U.S. Cl. 114—230 **8 Claims**



1. Apparatus for mooring a ship to a buoy or other offshore installation, comprising:

pulley means mounted on the offshore installation;

a hauling line extending about the pulley means and having a pair of opposite ends normally lying in the water;

a mooring block mounted on the ship and attachable to one of said ends of said hauling line;

a haul-line winch mounted on the ship, for pulling on another of said ends of said hauling line so that the mooring block is pulled to the offshore installation;

at least one second line stored on the ship and attached to the mooring block so that it is pulled to the offshore installation with said mooring block; and

means for locking the mooring block securely to the offshore installation

7. In a mooring system wherein a ship picks up the ends of a hauling line that extends about a pulley on a buoy, so that the ship can transfer a second line to the buoy by tying one end of the second line to an end of the hauling line and pulling in the other end of the hauling line, the improvement comprising:

a mooring block on the ship, said block having a hoseline pulley thereon;

a hose line having opposite ends on the ship and extending about the hoseline pulley on the block;

a hose disposed on the ship and attached to a first end portion of the hose line;

a hauling line winch disposed on the ship for pulling one end of the hauling line while the other end of the hauling line is attached to the mooring block, to pull the block to the buoy; and

a hose line winch disposed on the ship and engaged with a second end portion of the hose line which is opposite the first end portion, whereby when the mooring block is moved to the buoy and the hoseline winch is operated, the first end of the hose line and the hose attached thereto are pulled to the buoy.

3,863,591

MOORING BAR FOR BOATS

Leo Wild, 2 Secroft Crescent, Downsview, Ontario, Canada

Filed June 9, 1972, Ser. No. 261,257

Int. Cl. B63b *21/00*

U.S. Cl. 114—230 **10 Claims**

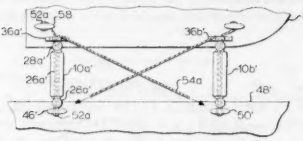
1. A mooring bar for mounting between a boat and a dock, said mooring bar comprising:

a. a central stiff elongaged member formed of a length of cylindrical tubing having a passage therein for a rope, and having first and second straight ends;

b. a pair of discrete joint members, one for each of said ends of said central member, each joint member being of resilient material and having a passage therethrough for said rope,

c. first and second caps at said first and second ends respectively of said central member, said caps having a cylindrical end of a diameter to plug snugly into said tubing and

an enlarged faced portion connected to said cylindrical end and having a concave surface for receiving said first and second joint members, said caps having a passage therethrough aligned with said passages of said central member and of said joint members to permit said rope to pass through all of said passages;



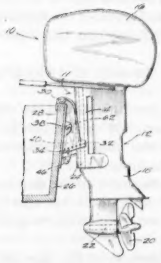
d. each joint member having a rounded surface adapted to seat on a said concave surface of said cap; one end of said rope extending through said central member and through said joint members so that said one end can be connected to a boat and the other end of said rope can be connected to a dock.

3,863,592

COMBINED DAMPING AND LIFT MEANS FOR MARINE PROPULSION DEVICE

Gaylord M. Borst, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Mar. 9, 1973, Ser. No. 339,587
Int. Cl. B63h *21/26*
U.S. Cl. 115—17 **8 Claims**



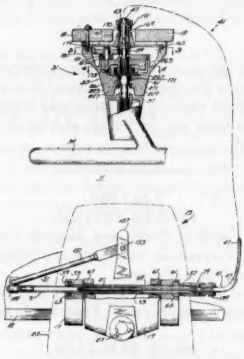
1. A marine propulsion device comprising a support bracket adapted to be attached to a boat hull, a propulsion assembly including a swivel bracket and a propulsion unit carried by said swivel bracket, means connecting said propulsion assembly and said support bracket on a horizontal transverse axis for tilting movement of said propulsion assembly in a vertical plane between an operating position and a raised, non-operating position, and cylinder-piston means for facilitating manual tilting movement of said propulsion assembly upwardly about said axis when said support bracket is attached to a boat hull and for absorbing shock in the event said propulsion assembly strikes an underwater obstacle, said cylinder-piston means comprising a cylinder including a first end and a second end, means for pivotally connecting said first end of said cylinder to one of said support bracket and said propulsion assembly, a piston located in said cylinder for reciprocative movement therein between a position adjacent said first cylinder end when said propulsion assembly is in the operating position and a position adjacent said second cylinder end when said propulsion assembly is in said raised position, means affording restricted fluid flow from one side of said piston to the other in both directions to control the rate of tilting movement between said support bracket and said propulsion assembly, a piston rod connected to said piston and extending from said second end of said cylinder, means for pivotally connecting said piston rod to the other of said support bracket and said propulsion assembly whereby, in response to an upward tilg movement of said propulsion assembly, said piston rod extends and, in response to a downward tilting movement of said propulsion assembly, said piston rod retracts, a predetermined quantity of an incompressible liquid partially filling said cylinder, and a pressurized gas at a pressure higher than atmospheric pressure filling the remainder of the otherwise unoccupied space inside said cylinder.

3,863,593

ROTARY CABLE STEERING SYSTEM

Gaylord M. Borst, and William J. Shimanckas, both of Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 244,682, April 17, 1972, Pat. No. 3,774,568. This application May 2, 1973, Ser. No. 356,510
Int. Cl. B63n *21/26*
U.S. Cl. 115—18 R **6 Claims**



1. A marine steering device comprising a housing adapted to be mounted on a bout hull and including spaced walls defining an interior chamber with an annular internal gear therein, a steering wheel shaft rotatably mounted by said housing, extending through one of said spaced walls, and including a first part extending in said chamber and a second part extending exteriorly of said chamber, a steering wheel mounted on said second steering wheel shaft part exteriorly of said housing, a carrier fixed on said first steering wheel shaft part in said chamber for common rotation with said steering wheel, an output shaft rotatably mounted by said housing, extending through the other of said spaced walls in co-axial relation to said steering wheel shaft, and having thereon a pinion located in said chamber and having common rotation with said output shaft, and means mounted on said carrier and in mesh with said internal gear and said pinion for rotatably driving said output shaft by said steering wheel shaft.

3,863,594

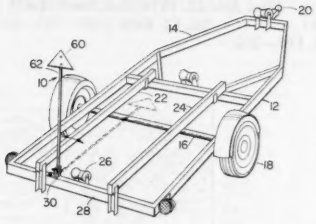
BOAT TRAILER BACKUP GUIDE

Theo C. Gawthrop, 121 N. Elm St., Columbia City, Ind. 46725

Filed Aug. 6, 1973, Ser. No. 385,991
Int. Cl. B60g *9/00*
U.S. Cl. 116—28 R **2 Claims**

1. In combination with a boat trailer including a frame having front and rear ends, a pair of laterally spaced, parallel, longitudinally extending skid elements having front and rear ends for supporting a boat thereon, and laterally extending

frame members connecting said skid elements adjacent their respective front and rear ends; a backup guide device comprising a mounting bracket secured to the laterally extending rear end member and between said skid elements, an elongated rod having opposite ends, one of said rod ends being pivotally connected to said bracket for manual movement of



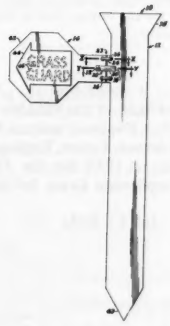
said rod only in the direction fore and aft of said frame between a first position extending generally vertically upwardly from said frame and a second position extending forwardly from said member between said skid elements beneath and spaced from a boat thereon, resilient detent means on said bracket for maintaining said rod in said first position thereof, and a flag element on the other of said rod ends.

3,863,595

GRASS GUARD DEVICE

Eugene R. Barnett, and Willard R. Barnett, both of 6268 Windsor Dr., Indianapolis, Ind. 46219

Filed Mar. 26, 1973, Ser. No. 344,928
Int. Cl. E01f *15/00*; **G08b** *7/00*
U.S. Cl. 116—63 R **3 Claims**



1. A grass guard device, comprising, in combination:

a supporting post member adapted to be forced into the ground;

the supporting post member carrying, adjacent its upper end, laterally-extending arm means adapted to extend over the edge of an associated roadway surface even though the supporting post member is thrust into the ground at a location aside of said roadway surface;

face;

the supporting post member and the arm means providing that if the said arm means is engaged by a vehicle on said roadway surface adjacent the edge thereof, the said arm means will audibly warn the driver of the vehicle of the adjacent proximity of the edge limit of the said roadway surface, and thus warn the driver to exert some driving maneuver to the vehicle to prevent it from being driven off the edge of the roadway surface;

the audible sound being produced by the said engagement of the arms means with a component of the vehicle such as its bumper, fender, tire or paneling, either by the relative movement thereof by the engagement thereof as the below-mentioned return-bias or return-movement of the arm means causes it to forcefully encounter one of said vehicle-components;

in which relatively movable means of the arm means and/or the supporting post member accommodates a substantial movement of the said arm means without altering the engagement of the supporting post-member and the ground;

and in which a relative resilient deformation, of the arm means and/or the supporting post member, occurring as an incident to movement of said arm means, causes a return-bias of the arm means and subsequently a return movement thereof subsequent to release of engagement thereof of the portion of the vehicle which had caused said movement;

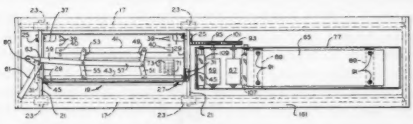
in a combination in which the said supporting post member and the said arm means are integrally connected in a unitary body member, which is of sufficient flexibility to provide the aforesaid relatively movable means resiliently accommodative of the said arm means movement without altering the ground engagement of the supporting post-member.

3,863,596

SEMI-AUTOMATIC BOOKBINDER

Clarence L. Anderson, Penfield, N.Y., assignor to Magnamatrix Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 133,026, April 12, 1971, Pat. No. 3,757,736. This application Jan. 5, 1973, Ser. No. 321,547
Int. Cl. B05c *1/02*; **B42c** *9/02*
U.S. Cl. 118—5 **12 Claims**



1. In a bookbinder comprising at least a frame, a clamp for clamping pages to be bound, said clamp mounted in a carriage movable on rods from one end of the frame to the other, and glue application means to apply glue to ends of the pages when said carriage is moved from one end to the other, improved glue application means comprising:

a. a container filled with glue;

b. a first applicator drum mounted for rotation on an axis perpendicular to the direction of movement of the carriage, with the bottom of said drum immersed in the glue;

c. a second drum similarly mounted parallel to said first drum;

d. a doctor blade mounted parallel to the axis of said second drum adjustable to wipe excess glue from said second drum when moved close to the circumference thereof and to permit said second drum to apply extra glue to the pages when moved away from said second drum;

e. means rotating said first drum in a direction such that its tangential velocity is in the same direction as the motion of the pages to be bound when moving from said one to said other end and rotate said second drum in a direction opposite thereto said means comprising:

1. an electric motor having a first sprocket on its shaft;

2. a second sprocket mounted to said first drum;

3. a third sprocket mounted to said second drum;
4. an endless chain linking said first, second and third sprockets; and

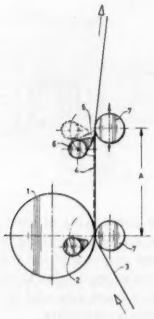
f. means coupling said motor to said carriage to provide a bi-directional drive, said means comprising:
1. a drive shaft parallel to the shaft of said motor and supported for rotation about its axis;
2. a fourth sprocket affixed to said shaft and contacting said chain so as to rotate in a direction opposite to the motor shaft;
3. a first pulley supported for rotation;
4. a second pulley similarly supported;
5. a first clutch coupling, when operated, said first pulley to the motor shaft;
6. a second clutch coupling, when operated, said second pulley to said drive shaft;
7. means to selectively operate one of said first and second clutches;
8. a first idler pulley mounted at one end of the frame;
9. a second idler pulley mounted at the other end of the frame; and
10. a cable having a first end coupled to the side of said carriage closest said first idler, said cable being passed over said first idler to said first pulley then around said first pulley, thence around said second pulley, thence over said second idler and the second end of said cable coupled to the other side of said carriage.

3,863,597

DEVICE FOR APPLYING A COATING LAYER

Lodewijk Anselrode, 27 Peelkant, St. Anthonis, Netherlands

Continuation-in-part of Ser. No. 222,527, Feb. 1, 1972, abandoned. This application July 5, 1973, Ser. No. 376,390
Claims priority, application Netherlands, Feb. 13, 1971, 7101419
Int. Cl. B05c *11/04*
U.S. Cl. 118—126 **2 Claims**



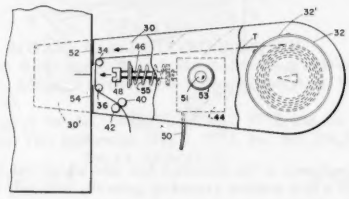
1. A device for applying a uniform smooth surface coating layer to an advancing web consisting of an apparatus contacting an advancing web for applying the coating substance to said web, and a vertically disposed doctor blade member for accurately and evenly striking off the applied coating material, said application apparatus comprising a cylindrical mesh stencil having an inner squeegee therein to provide a uniform distribution of the coating substance upon the web in contact with said stencil, said member comprising a very thin flexible blade contacting the coating substance on the web under a slightly resilient pressure and disposed at a very small angle relative to the web, the coated web moving in an upward direction, a plurality of vertically aligned rollers guiding said advancing web, one of said guide rollers being operatively associated as a backup member with respect to said doctor blade, and said one roll being adjustable, in its back-up position, between a location just in front of to a location just in back of the point of said blade contact.

3,863,598

DEVICE FOR MARKING MATERIAL

John H. Roper, 1325 Eutaw Place, Baltimore, Md. 21217

Filed Jan. 22, 1974, Ser. No. 435,436
Int. Cl. B05c *1/00*
U.S. Cl. 118—202 **4 Claims**



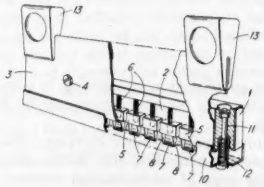
1. A device for marking the edges of a stack of material formed from a plurality of individual layers, comprising in combination:
a. a base;
b. means for rotatably supporting a roll of marking tape on said base, said tape having a heat-dissolvable material on one side thereof;
c. means for supporting the side of the tape carrying the heat-dissolvable material in close proximity to the edges of the stack of material;
d. a heated plate fixedly supported on said base;
e. means for moving the heated plate in contact with the edges of the stack of material for engaging the same for depositing at least a portion of the material carried by the tape on the edges of the stack of material, and
f. a motor having means connected to the heated plate for operating the same.

3,863,599

APPLICATOR MEANS

Joachim Kohn, London, England, assignor to Shandon Southern Instruments Limited, Surrey, England

Filed Jan. 23, 1974, Ser. No. 435,722
Claims priority, application Great Britain, Jan. 23, 1973, 3431/73
Int. Cl. B05c *1/06*
U.S. Cl. 118—256 **7 Claims**



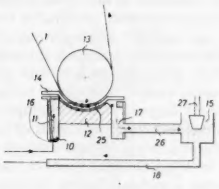
1. An applicator for forming on a substrate a number of spaced colinear liquid streaks each having substantially the same volume of liquid per unit length, comprising a body, an array of colinear spaced-apart liquid-holding and applicating strands of similar dimension spaced from the body, and support members freely suspending the strands from the body and engaging solely the ends of the strands.

3,863,600

ADJUSTABLE COATING PAN

Ludovicus Carolus Van Regenmortel, Hoboken, Belgium, assignor to Agfa-Gevaert, Mortsel, Belgium

Filed May 2, 1973, Ser. No. 356,440
Claims priority, application Great Britain, May 3, 1972, 20665/72
Int. Cl. B05c 3/12, 3/18
U.S. Cl. 118—419 14 Claims



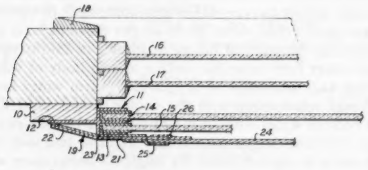
1. A coating apparatus for applying a liquid coating composition to a moving web, comprising a rotatable backing roller for determining a path for the web, a coating pan disposed under said backing roller for holding coating solution in said web path, and means for continuously delivering coating solution into said pan, over the full length thereof, said coating pan having end dams which determine the effective internal length of the pan and which are shaped and located so that their top edges conform to the curvature of the surface of the backing roller but are spaced from that surface a distance substantially greater than the thickness of said web, at least one of said dams being displaceable for varying said effective length, and said coating pan also having an overflow edge over which liquid can continuously discharge from the pan over the whole of said effective length, which overflow edge is at a level above the level of the lowest points on the top edges of said dams.

3,863,601

SURFACE MASKING DEVICE FOR PAINTERS

Edmund Albert Eckart, Jr., Westport, Conn., assignor to Sapolin Paints, Inc., New York, N.Y.

Filed Jan. 25, 1974, Ser. No. 436,555
Int. Cl. B05c 11/16
U.S. Cl. 118—505 9 Claims



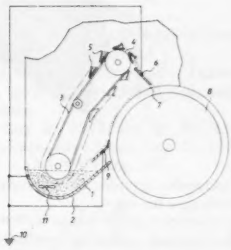
1. A surface masking device for masking selected corners of rectangular window frames including storm window sash channels and adjacent portions of a window pane, said masking device comprising a pair of shields each having at least one complimentary mitered end, each shield including a marginal body portion and an interior extension panel and having means for attaching said extension panel to said body portion, said masking device having adhesive attaching means on at least one of said shields enabling said shield to be temporarily attached to a window frame section and self supported thereon during a painting operation.

3,863,602

XEROGRAPHIC COPYING APPARATUS

Joachim Mueller, and Ludwig Dengler, both of Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 21, 1972, Ser. No. 308,332
Claims priority, application Germany, Nov. 24, 1971, 2158334
Int. Cl. G03g 13/00
U.S. Cl. 118—636 5 Claims

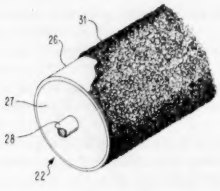


1. In a xerographic copying apparatus wherein a rotary drum-shaped xerographic surface is arranged to carry electrostatic latent images along a predetermined path, a development unit for converting said latent images into powder image patterns, comprising a magazine for a supply of intermixed toner and carrier particles; and a conveyor arranged to withdraw intermixed particles from said supply and to cascade the thus withdrawn particles over latent images in said path whereby the surplus of particles reenters said magazine and the particles become electrostatically charged as a result of triboelectrification during circulation in and back to said magazine, said conveyor including a series of discrete receptacles arranged to transport batches of intermixed particles from said magazine to a level above said supply and to dump the respective batches onto said xerographic surface upon reaching said level, said development unit having a plurality of particle-contacting surfaces including the particle-contacting surfaces of said magazine and said conveyor, said plurality of surfaces exhibiting neutral characteristics with respect to the overall triboelectric charge of said supply of particles and including a first group of surfaces which constitute the surfaces of said receptacles and move with said particles and a second group of surfaces, the particles which contact the surfaces of said first group being in motion relative to the surfaces of said second group, the surfaces of said first group consisting of insulating material and the surfaces of said second group consisting of current-conducting material and being connected to the ground, each of said receptacles consisting of current-conducting material having a coat of insulating material so that the surfaces of said second group are provided on said coats, said second group of surfaces comprising a first chute arranged to convey particles discharged by said conveyor into said path and a second chute for intercepting surplus particles in said path and for returning the intercepted particles into said magazine.

3,863,603
MAGNETIC BRUSH ROLL HAVING RESILIENT POLYMERIC SURFACE

Lawrence Webb Buckley; Raymond Alex Daniels, both of Lexington; James Dewayne Froula, Versailles; Arthur Holt Knight, Frankfort, all of Ky.; Dale Cliffton Stapleton, Boulder, Colo., and George Thomas Williams, Georgetown, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,275
Int. Cl. G03g *13/06*
U.S. Cl. 118—637 **10 Claims**

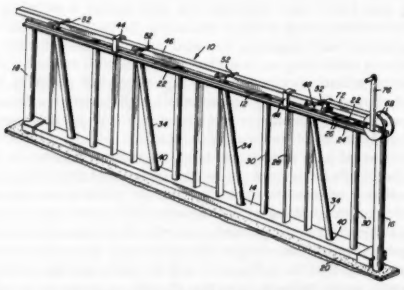


1. In an electrophotographic development apparatus of the magnetic brush type having:
a surface on which a latent image is formed;
a rotatably mounted hollow roll including a core of non-magnetic material and a resilient polymeric material secured to said core to form the surface of said roll;
said resilient polymeric material having at least its surface electrically conductive;
said resilient polymeric material having its surface non-abrasive, abrasion resistant, and rough;
magnetic means disposed within said core for creating a magnetic field in the path of the periphery of said roll;
and means to bring a developer material into contact with the surface of said resilient polymeric material of said roll, said roll being disposed adjacent said surface on which the latent image is formed so that said roll can transport the developer material in a brush-like configuration to the surface on which the latent image is formed.

3,863,604
STANCHION PANEL

Floyd P. Nielsen, 5650 W. Bethany Home Rd., Glendale, Ariz. 85301, and Bernard O. Anderson, 5341 W. Banff Ln., Phoenix, Ariz. 85306

Filed Aug. 23, 1973, Ser. No. 390,859
Int. Cl. A01k *1/06*
U.S. Cl. 119—148 **3 Claims**

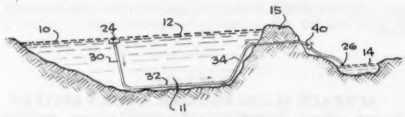


1. A stanchion gate assembly including at least one horizontally elongated and upstanding stanchion assembly, said assembly comprising vertically spaced generally horizontal upper and lower elongated supports interconnected at corresponding ends by means of upstanding end members extending and secured between said corresponding ends, a plurality of pairs of generally vertical spaced apart adjacent bars spaced along said assembly and extending between and rigidly connected to said supports, each pair of adjacent bars defining gate bars and being spaced apart a distance sufficient to receive the head of an animal therebetween, and a supplemental upstanding gate member disposed between the bars of each pair of adjacent bars with the lower ends of said gate members supported from said lower support intermediate the corresponding pair of adjacent bars for angular displacement about a horizontal axis transverse to said lower support and with the upper end of said gate member oscillatable lengthwise of said upper support, an actuator guidingly supported from said assembly for horizontal reciprocation therealong and operatively connected to the upper ends of said gate members for oscillating said upper ends in response to reciprocation of said actuator, said lower support member comprising an inverted channel-shaped member, the lower ends of said vertical bars being secured through bores formed through the upper bight portion of said inverted channel member, said bight portion additionally having apertures formed therein through which the lower ends of said gate members are loosely received, and a transverse brace secured between the opposite sides of said inverted channel-shaped member spaced below and in vertical registry with each of said apertures, the lower ends of said gate members resting upon said braces.

3,863,605
METHOD FOR PROVIDING COOLED AERATED WATER

Leslie E. Gallup, Box 116, Morrisville, N.C. 27560

Filed Oct. 1, 1973, Ser. No. 402,632
Int. Cl. A01k *63/00*
U.S. Cl. 119—3 **6 Claims**

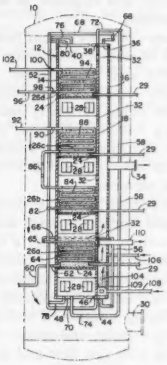


1. A method of providing a quantity of water having a high oxygen content and a relatively low temperature from a body of water having oxygen-rich warm water near its surface and oxygen-poor cooler water in its deeper portions, said method comprising the steps of taking quantities of said oxygen-rich warm water from near the surface of said body of water and moving said quantities of oxygen-rich warm water into heat exchange relationship with the cooler oxygen-poor water in said body of water without intermixing the oxygen-rich warm water with the oxygen-poor cooler water so that said oxygen-rich water is cooled below its original temperature wherein said oxygen-rich warm water is moved into heat exchange relationship with said oxygen-poor cooler water by causing said oxygen-rich warm water to flow into the end of a conduit positioned in said oxygen-rich warm water and causing said oxygen-rich warm water entering said conduit to flow to and through a substantial length of said conduit positioned in said oxygen-poor cooler water so that heat in said oxygen-rich warm water in said conduit flows through the walls of said conduit into said oxygen-poor cooler water to consequently lower the temperature of said oxygen-rich water to provide cooled oxygen-rich water and further including the step of discharging said cooled oxygen-rich water from said conduit into storage means subsequent to the cooling of said oxygen-rich water in said conduit.

3,863,606
VAPOR GENERATING SYSTEM UTILIZING FLUIDIZED BEDS

Richard W. Bryers, Cranford, N.J., and Jack D. Shenker, Lancaster, Ohio, assignors to The United States of America as represented by the Administrator of the U.S. Environmental Protection Agency, Washington, D.C.

Filed July 25, 1973, Ser. No. 382,404
Int. Cl. F22b *1/02*
U.S. Cl. 122—4 D **7 Claims**

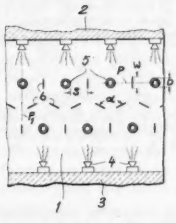


1. A vapor generating system comprising a housing, means defining a plurality of vertically aligned beds of particulate fuel material in said housing, a source of pressurized air, means to pass said pressurized air through each of said beds to promote the combustion of said fuel and maintain said beds at predetermined temperatures, a plurality of vertically disposed tubes connected together to form the walls of said housing for passing a heat exchange medium in a heat exchange relation to said beds, and piping means for directing said medium into the lower ends of a portion of said tubes for passage upwardly to the upper ends thereof and from the upper ends of said tubes downwardly externally of said tubes and back into another portion of said tubes for passage upwardly therethrough.

3,863,607
TUBE FURNACE FOR THERMAL DECOMPOSITION PROCESS

Walter Kreuter, Munich, Germany, assignor to linde Aktiengesellschaft, Wiesbaden, Germany

Filed Jan. 18, 1974, Ser. No. 434,570
Claims priority, application Germany, Jan. 19, 1973, 2302612
Int. Cl. F22b *21/00*
U.S. Cl. 122—333 **12 Claims**

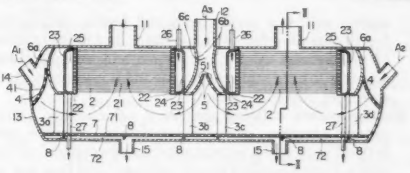


1. A tube furnace comprising a radiation chamber, a multiplicity of furnace tubes in said chamber and in spaced apart relation, heating means in said chamber for heating said tubes, and radiating surfaces in said chamber disposed along said tubes for absorbing heat from said chambers and reradiating heat to said tubes to maintain the heat transfer per unit surface thereof substantially constant all along and around said tubes, said tubes being disposed in at least two planar and mutually parallel arrays with the tubes of one array being offset with respect to the tubes of the other array by about half the distance between the tubes of each array and each of said tubes is flanked by a pair of said radiating surfaces each extending perpendicular to the plane of the axis of the tubes of the respective array, each of said radiating surfaces being a planar strip of a width at least equal to that of the diameter of the tube disposed midway between a pair of tubes of each array and said radiating surfaces include like strips disposed equidistantly between each tube of one array and a pair of tubes of the other array and perpendicular to common axial plane of the tubes between which the strips are disposed.

3,863,608
STEAM HEATING APPARATUS WITH MOISTURE SEPARATORS

Norio Yasugahira; Kuniyoshi Tsubouchi; Takeshi Sato, and Akira Uenishi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 20, 1973, Ser. No. 389,820
Claims priority, application Japan, Aug. 23, 1972, 47-83783
Int. Cl. F22g *1/00*
U.S. Cl. 122—483 **10 Claims**



1. A steam heating apparatus with moisture separators, comprising: an elongated tubular shell having a pair of opposite axial end plates for effectively closing the respective ends of the tubular shell; a plurality of steam heaters each disposed substantially parallel with the axis of the tubular shell and in the upper portion of said tubular shell; each of said steam heaters having a plurality of generally axially extending heat exchange tubes, inlet means for introducing a heat exchange fluid into said plurality of said tubes, and fluid outlet means for exhausting the heat exchange fluid from the opposite ends of said tubes; a plurality of moisture separators disposed in the lower portion of said tubular shell respectively adjacent the axial ends of said steam heaters; a plurality of inlets provided on said shell structure adjacent to the axial ends of said steam heaters for introducing moisture laden steam; steam outlets for passing steam from the tubular shell to the exterior; and passage means for conducting the steam from said steam inlets through said moisture separators, through said steam heaters, and through said steam outlets serially in order.

3,863,609
ROTARY ENGINE

Yoshio Ikarashi, No. 3-15, Otemachi 1-chome, Shibata, Japan

Filed Sept. 19, 1972, Ser. No. 290,343
Int. Cl. F02b *53/08*
U.S. Cl. 123—8.07 **10 Claims**

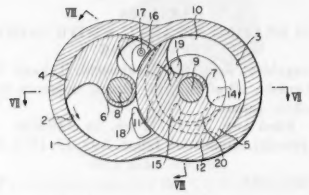
1. A rotary engine, comprising:

first and second rotor means respectively mounted for rotation about first and second parallel axes, each of said rotor means comprising an arcuate sector of selected angular extent so that the sectors of said first and second rotor means complement one another and total approximately 360°;

said first rotor means having the sector thereof defined by a first cylindrical surface which extends through a first arcuate extent, said first cylindrical surface being generated by a first radius defined about said first axis, said

sector also being defined by a first curved surface which connects to one end of said first cylindrical surface and extends radially inwardly toward said first axis, said sector being still further defined by a second curved surface which is connected to the other end of said first cylindrical surface and extends radially inwardly toward said first axis and is interconnected to said first curved surface;

said second rotor means having the sector thereof defined by a second cylindrical surface which extends through a second arcuate extent, said second cylindrical surface being generated by a second radius defined about said second axis, said second radius being equal to said first radius, said sector also being defined by a third curved surface which connects to one end of said second cylindrical surface and extends radially inwardly toward said



second axis, said sector being still further defined by a fourth curved surface which is connected to the other end of said second cylindrical surface and extends radially inwardly toward said second axis and is interconnected to said third curved surface;

housing means defining therein a substantially cocoon-shaped chamber, said cocoon-shaped chamber being defined by first and second substantially cylindrical bores which extend parallel to one another, said first and second bores each being defined by a third radius which is substantially equal to said first radius, and the longitudinally extending axes of said bores being spaced apart by a distance less than the diameter of each bore so that the two bores overlap so as to be in open communication with one another;

said housing means including sidewall means surrounding said cocoon-shaped chamber and a pair of end wall means fixed to said sidewall means and closing the opposite ends of said cocoon-shaped chamber;

means rotatably supporting said first and second rotor means in said first and second bores, respectively, whereby the axis of rotation of the respective rotor means is aligned with the longitudinally extending axis of the respective bore;

said first curved surface being generated by providing a disk defined by a radius equal to said first radius, positioning a curve generating line adjacent said disk so that it overlies a reference line on said disk which extends radially outwardly from the center of said disk, said curve generating line having a length equal to said first radius and being positioned to overlie said reference line so that a first point defining the inner end of said generating line is disposed more closely adjacent the center of said disk and a second point defining the outer end of said generating line is disposed more closely adjacent the periphery of said disk, rotating the curve generating line about said second point in a rotational direction which is substantially parallel with said disk and simultaneously therewith rotating the disk about its center in the reverse rotational direction at the same angular velocity as said curve generating line, whereby the first point defines on said disk a curve which extends from said reference line to the periphery of said disk, said curve being the configuration of said first curved surface;

said second curved surface as formed on said first rotor means being a mirror image of said first curved surface; said third curved surface as formed on said second rotor means being generated in the same manner as said first curved surface, and said fourth curved surface being the mirror image of said third curved surface;

one of said end wall means having an annular ring-shaped channel formed therein in concentric relationship to said second axis, said ring-shaped channel projecting inwardly from the inner surface of said one end wall means whereby said ring-shaped channel communicates with said cocoon-shaped chamber, said one end wall means having a disk-shaped portion surrounded by said ring-shaped channel and having an end face thereon disposed directly adjacent and opposite to an end face on said second rotor means;

a ring-shaped flow control element fixed to and projecting from one end of said second rotor means and slidably disposed within said ring-shaped channel, said ring-shaped element having an outwardly opening groove formed on the outer periphery thereof and extending angularly along half of said outer periphery, said ring-shaped element further having a flow opening providing communication between said groove and the inner periphery of said element;

said disk-shaped portion having a recess formed in the end face thereof and opening toward said second bore, said disk-shaped portion also having a communication hole formed therein and extending between said recess and the outer periphery of said disk-shaped portion, whereby said opening and said hole intermittently communicate with one another during rotation of said second rotor means; means defining exhaust and intake opening respectively communicating with said first and second bores for permitting discharge of gases from said first bore and supply of gases to said second bore;

ignition means associated with said chamber for igniting a combustible gas located therein, said ignition means including an ignition chamber communicating with said first bore and also communicating with said ring-shaped channel, whereby said ignition chamber intermittently communicates with said groove during rotation of said second rotor means; and

means drivingly interconnecting said first and second rotor means for synchronous rotation in opposite directions.

3,863,610

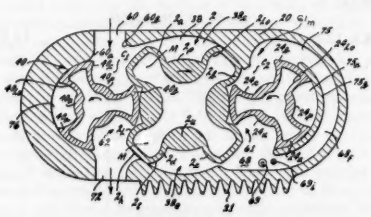
ROTARY CONVERTERS HAVING SPECIALIZED INTERLEAVING ELEMENTS

Raymond G. Spinnett, 2531 S. Salta St., Santa Ana, Calif. 92704

Division of Ser. No. 281,645, Aug. 18, 1972,. This application June 4, 1973, Ser. No. 366,856

Int. Cl. F02b *53/00*

U.S. Cl. 123—8.27 **15 Claims**



1. A rotary energy converter comprising:

a. a casing defining a central chamber and a plurality of peripheral chambers, each of said peripheral chambers having areas in common with said central chamber;

b. a central rotor mounted for rotation in said central chamber and having a plurality of abutment piston-lobes ex-

tending radially to form pistons for rotary movement in said central chamber;

c. a first peripheral valving rotor mounted for rotation in said first one of said peripheral chambers and having a plurality of abutment-lobes extending radially therefrom and operating in interleaving non-contiguous relationship with said abutment piston-lobes of said of the second peripheral chamber central rotor;

d. a second peripheral valving rotor including a central hub mounted for rotation in said second peripheral chamber and having a plurality of abutment-lobes extending radially, said abutment-lobes operating in cooperative interleaving relationship with and non-contiguous to said piston-lobes of said central rotor;

e. and wherein said abutment-lobes of said first and second peripheral valving rotors cooperate in rotary motion with said piston abutment-lobes to form sealed function-chambers during rotary phases of the central rotor cycle;

f. means for intake of a charge;

g. means for exhaust of combusted gases;

h. a combustion chamber located within said second peripheral chamber;

i. a mixing chamber in said second peripheral chamber, said mixing chamber being located at the opposite side from said combustion chamber;

j. means for ignition of charge in said combustion chamber;

k. internal separation means within said second peripheral chamber and forming a feedback channel between said combustion chamber and said mixing chamber.

3,863,611

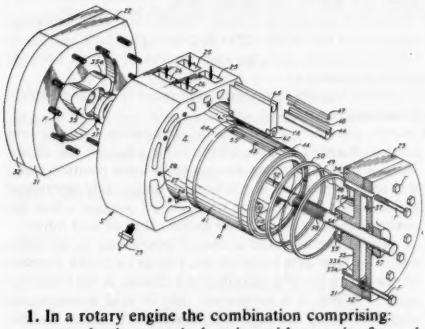
ROTARY ENGINE

Stefan Bakos, 4181 S. Verbena, Denver, Colo. 80237

Filed May 7, 1973, Ser. No. 358,056

Int. Cl. F02b *55/14*

U.S. Cl. 123—8.45 **7 Claims**



1. In a rotary engine the combination comprising:

a stator having a main housing with a cavity formed as a throughbore and an inlet port for passing a fuel-air mixture into the cavity and an outlet port for passing products of combustion from the cavity, said main housing having a water jacket, and end caps attached to the ends of the main housing forming the ends of the cavity, each of said end caps having a recessed portion in the inner side thereof;

a rotor having a rotor body having three radial slots arranged at 120° intervals with a circular transverse cross section mounted for rotation about a fixed axis in bearings supported in the end caps, said rotor being undercut in each end forming an inner recess and an overhanging end portion that projects into the recessed portion in an associated end cap;

the stator and rotor defining therebetween and annular space including a relatively narrow, intermediate space segment formed by surfaces arranged concentric with the fixed axis and extending through an arc between about 135° and about 225° from a reference of 0° between the inlet port and outlet port, a larger generally crescent-shaped upstream space segment in communication with the inlet port formed by concave stator surfaces arranged eccentric with the fixed axis and extending through an arc between about 0° and 135° from a reference of 0°, a larger generally crescent-shaped downstream space segment in communcation with the outlet port formed by concave stator surfaces arranged eccentric with the fixed axis and extending through an arc between about 225° and about 360° from the reference of 0°, each of said intermediate, upstream and downstream space segments being joined by a convex stator surface formed by a radius having its center externally of the stator;

three radial vanes, each vane having an oblong vane body slidably movable in one of the radial slots, each said vane body having a rounded inner end with bearing means adapted to move over a cam surface and a circular groove in the outer end carrying a generally circular head rotatable in the groove and a sealing ring movable in the head; a cam on the end caps at each end of the rotor having cam surfaces projecting into the inner recess of the rotor and having a contour similar to that of the stator cavity on which the inner ends of the vanes ride as the rotor is rotated to urge the ring carried by the head against the inner peripheral surface of the stator defining the cavity with the head rotating relative to the vane body;

sealing means between the rotor and the vane body in the slots;

first sealing rings in grooves in the periphery of the overhanging end portion of the rotor body in engagement with recessed portions of the end caps;

second sealing rings in grooves at the ends of the overhanging end portions of the rotor body in enagement with the recessed portions of the end caps;

said stator, rotor vanes and sealing means, first sealing rings and second sealing rings dividing the annular space into separate working chambers between each two adjacent vanes to confine the fuel-air mixture thereto whereby a fuel-air mixture is successively induced through the inlet port into the upstream space segment between two adjacent vanes and then compressed in the intermediate space segment between two adjacent vanes upon rotation of the rotor;

an ignition element positioned in the intermediate space segment for igniting the compressed fuel-air mixture just upstream of a vane to propel the rotor and produce products of combustion by the ignition whereby movement of the vane moves the resulting products of combustion through said downstream space segment and out the outlet port for each revolution of each vane.

3,863,612

COOLING SYSTEM

Leonard Stern Wiener, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Sept. 17, 1973, Ser. No. 398,251

Int. Cl. F01p *7/14*

U.S. Cl. 123—41.08 **8 Claims**

1. A cooling system comprising:

a. a first heat source to be cooled by the flow therethrough of a coolant at a first temperature;

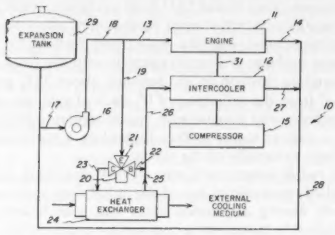
b. a second heat source to be cooled by the flow therethrough of a coolant at a second temperature lower than said first temperature;

c. means for combining the total discharge flows from said first and second heat sources to form a coolant mixture at a temperature no higher than that of said first temperature;

d. means for pumping said coolant mixture toward the inlets of said first and second heat sources;

e. means for proportioning the total coolant mixture flow

between said first and second heat sources; and



f. a heat exchanger means for cooling that proportion of coolant being delivered to the inlet of said second heat source.

3,863,613

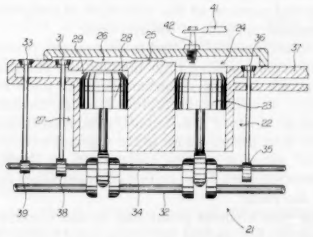
INTERNAL COMBUSTION ENGINE

Frank J. Petrie, 93b Beaver Terrace Cir., Framingham, Mass. 01701

Filed July 16, 1973, Ser. No. 379,235

Int. Cl. F02b *21/00, 33/44*

U.S. Cl. 123—75 R **5 Claims**



1. An internal combustion engine comprising:

a primary cylinder slidably retaining a primary piston and defining a primary combustion chamber;

an auxiliary combustion chamber;

a coupling passage for providing fluid communication between said chambers;

an air supply cylinder slidably retaining an air supply piston and defining an air supply chamber;

air inlet means for selectively supplying air to said air supply chamber;

crankshaft means for coupling said pistons and causing them to move synchronously;

valve means providing fluid communication between said air supply chamber and said auxiliary combustion chamber;

valve control means for operating said valve means in a preselected cycle during the operation of said engine, said valve control means comprising a valve timing means for opening said valve means to provide fluid communication between said air supply chamber and said auxiliary combustion chamber during every other stroke of said primary piston; and

exhaust valve means for exhausting hot gases from said primary combustion chamber, said primary combustion chamber being disposed in a fluid flow path between said auxiliary combustion chamber and said exhaust valve whereby gases discharged from said auxiliary chamber flow through and thereby purge said primary chamber before being exhausted through said exhaust valve.

3,863,614

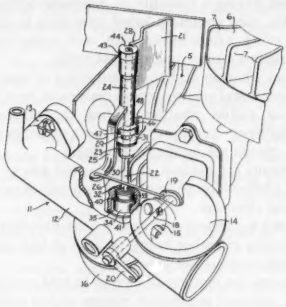
THERMOSTATIC AUTOMATIC CHOKE CONTROL FOR SMALL ENGINES

Robert G. Thompson, Milwaukee, and Heinz K. Gund, Brookfield, both of Wis., assignors to Briggs Stratton Corporation, Wauwatosa, Wis.

Filed Nov. 19, 1973, Ser. No. 417,402

Int. Cl. F02b *33/00;* **F02m** *7/00*

U.S. Cl. 123—119 F **9 Claims**



8. In an internal combustion engine having relatively fixed structure comprising a carburetor with an air inlet duct and having a choke valve in said air inlet duct which is movable between defined open and closed positions and which is biased towards its closed position, an automatic control for the choke valve comprising:

A. actuating means operable to produce in response to engine speed a choke valve opening force that can overcome the bias on the choke valve;

B. motion transmitting means connecting said actuating means with the choke valve and through which said force can be imposed upon the choke valve to urge it towards its open position;

C. a control member constrained to move in opposite directions between defined limits;

D. means providing a lost motion connection between said control member and the choke valve whereby the choke valve is prevented from moving to its open position when the control member is confined at one of said limits and is prevented from moving to its closed position when the control member is confined at the other of said limits;

E. a pair of thermostatic elements positioned to be influenced by heat developed by the engine and each capable of exerting a force in response to a change in the temperature to which it is subjected, one of said thermostatic elements being for high temperaturs, the other for low ones; and

F. means connecting each of said thermostatic elements between the fixed structure and the control member to produce a force exerting reaction between them in only one direction, the last mentioned means comprising a unidirectional force transmitting connection for each thermostatic element,

1. the unidirectional force transmitting connection for the low temperature thermostatic element being so arranged that the force which the low temperature thermostatic element exerts in response to decreasing temperatures is imposed upon the control member in the direction to urge the same towards said one limit, and

2. the unidirectional force transmitting connection for the high temperature thermostatic element being so arranged that the force which the high temperature thermostatic element exerts in response to increasing temperatures is imposed upon the control member in the direction to urge the same towards its said other limit.

3,863,615

METHOD OF AND SYSTEM FOR CONTROLLING AIR TO FUEL RATIO FOR AN INTERNAL COMBUSTION ENGINE

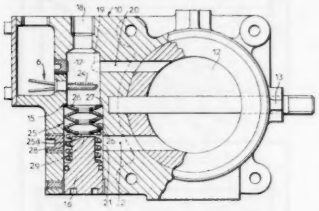
Brian Colin Pagdin, Sutton Coldfield, England, assignor to GKN Transmissions Limited, Erdington, Birmingham, England

Filed Feb. 6, 1974, Ser. No. 440,265

Claims priority, application Great Britain, Feb. 6, 1973, 5761/73

Int. Cl. F02m *25/06*

U.S. Cl. 123—119 A 10 Claims



1. A system for supplementing the control of air to fuel ratio provided by a fuel supply apparatus of an internal combustion engine, such system comprising:

a. means for withdrawing a fraction of the exhaust of the engine from an outflow path for such exhaust,

b. means for burning a combustible constituent of said withdrawn fraction of exhaust,

c. means for feeding the products of such combustion to an intake of the engine,

d. means for controlling the ratio of said products of combustion fed to said intake to air drawn into said intake as a function of the heat produced by said combustion.

3,863,616

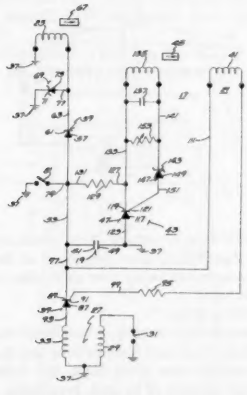
CAPACITOR DISCHARGE SYSTEM WITH SPEED CONTROL SUB-CIRCUIT

Donald H. Wood, Gurnee, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sept. 13, 1971, Ser. No. 179,768

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 E 4 Claims



1. A capacitor discharge ignition system for an internal combustion engine comprising a capacitor, a first rotating magnet, a charge coil having a core located adjacent to the path of first magnet rotation and electrically connected to said capacitor, said charge coil being operative in response to first magnet rotation to charge said capacitor, an ignition coil, a first electronic switch electrically connected to said capacitor for selectively discharging said capacitor to said ignition coil, a second electronic switch electrically connected to said capacitor for selectively discharging said capacitor other than to said ignition coil and including a contol terminal, a voltage breakdown device connected to said control terminal and operable to permit conduction upon the application of potential above a given level, an annular magnet comprising a first segment having an arcuate extent of less than 360° and an arcuate periphery of one polarity and a second segment having an arcuate extent slightly less than the difference between 360° and the arcuate extent of the first segment and an arcuate periphery of the other polarity, a trigger coil having a core extending radially from and located adjacent to the rotational path of said arcuate peripheries and electrically connected to said first switch, said trigger coil being operable in response to annular magnet rotation to generate a trigger pulse which actuates said first switch to discharge said capacitor to said ignition coil so as to cause engine ignition, and an overspeed control coil having a core extending radially from and located adjacent to the rotational path of said arcuate peripheries and electrically connected to said voltage breakdown device, said overspeed control coil being operable in response to annular magnet rotation above a predetermined speed to generate a speed control pulse having a potential above said given level, said overspeed control coil core being located relative to said trigger coil core to generate said speed control pulse subsequent to charging of said capacitor and prior to generation of said trigger pulse, whereby to cause conduction of said breakdown device and operation of said second switch to discharge said capacitor other than to said ignition coil and render subsequent operation of said ignition trigger coil ineffective to cause engine operation.

3,863,617

INTERNAL COMBUSTION ENGINE WITH SOUND-PROOF V-BELT PULLEY

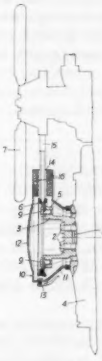
Gerhard Thien, and Heinz Fachbach, both of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Nov. 8, 1973, Ser. No. 414,098

Claims priority, application Austria, Nov. 10, 1972, 9617/72

Int. Cl. E04b *1/99*; G10k *11/04*

U.S. Cl. 123—195 C 2 Claims



1. An internal combustion engine having a crankshaft, a crank wheel and further comprising a vee-belt pulley arranged in front of the crank wheel cover and non-rotatably connected with the crankshaft, a sound-proofing sheathing encompassing said vee-belt pulley and consisting of a sheathing member elastically attached to said crank wheel cover so as to provide sound-proof sealing and partly embracing said vee-belt pulley, and a cover located in front of the vee-belt pulley and remov-

ably attached to said sheathing member, vee-belts extending through said sound-proof sheathing at two passages, sound-absorbing inserts being provided on said sheathing member and said cover at the passages of the vee-belt, said sound-absorbing inserts combining at each passage to provide an absorption-type silencer closely encompassing the vee-belt.

3,863,618

BUTTERFLY VALVE ARRANGEMENT FOR A COMBUSTION ENGINE HAVING EXTERNAL IGNITION

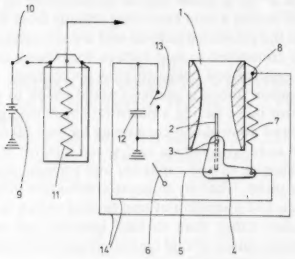
Norbert Scholz, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed July 16, 1973, Ser. No. 379,352

Claims priority, application Germany, Aug. 31, 1972, 2242737

Int. Cl. F02b *77/08*; **F02p** *11/00*

U.S. Cl. 123—198 DC **2 Claims**



1. In a combustion engine having combustion space means, an ignition arrangement for deliverying an ignition spark to the combustion space means, a butterfly valve means for controlling the fuel mixture to said combustion space means, a closure spring means for returning said butterfly valve means into a closed position when an associated accelerator is not actuated, said ignition circuit arrangement including said closure spring means, whereby when said closure spring means develop a discontinuity, said ignition circuit arrangement is prevented from delivering a spark to said combustion space means wherein said ignition circuit arrangement includes an ignition coil means and an interrupter contact means, a circuit portion connecting said ignition coil means with said interrupter contact means, said closure spring means being placed into said circuit portion.

3,863,619

COLLAPSIBLE HEAT SHIELD FOR WINDOW OF OVEN DOOR

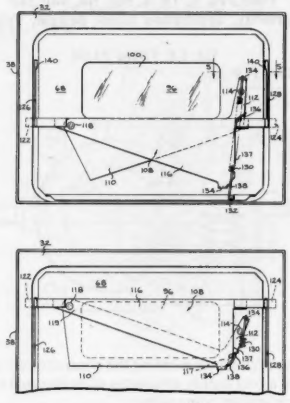
Robert A. Wolf, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 6, 1974, Ser. No. 467,503

Int. Cl. F23m *7/00*

U.S. Cl. 126—200 **6 Claims**

1. A door construction comprising an outer panel and an inner door liner spaced inwardly therefrom, substantially alinged window openings in said panel and door liner, and transparent panes closing said window openings, a movable shield located within the door for movement into a closed position between said transparent panes to obstruct the view through said window openings, said shield being collapsible when moved to its open position out of registry with the transparent panes to permit viewing through said panes, said shield being in at least two parts, a first part hinged within the door structure and a second part hinged to the first part, said first and second shield parts overlying each other in said collapsed open position and being fanned out in the closed position of the shield, and counterbalance spring means associated with



the hinge means of the first shield part to the door for holding the two-part shield in either its open or closed positions.

3,863,620

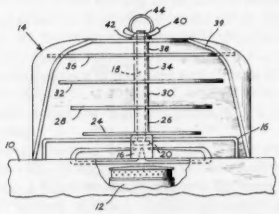
DEVICE FOR BENEFICIALLY ABSORBING, RERADIATING AND DEFLECTING HEAT TO THE OCCUPIED PORTION OF AN ENCLOSURE

Lawrence L. Warner, 1670 N.E. "A" St., Grants Pass, Oreg. 97526

Filed Jan. 14, 1974, Ser. No. 432,807

Int. Cl. F24c *15/00*

U.S. Cl. 126—248 **5 Claims**



1. A portable heat absorbing, heat reradiating and air deflecting and distributing unit composed of heat conductive material and adapted to be set over an extraneous heat source which unit includes

a. a supporting means;

b. a hood supported thereby, which hood includes uninterrupted side, back and top portions and has a wide open bottom and a wide open front, for deflecting a rising convection current of heated, breathable air in a generally horizontal direction through the open side of the hood from bottom to top thereof where it may reach and be useful to persons occupying a relatively low portion of such space, said unit further including, largely within the hood, a series of vertically spaced, horizontal, heat ab-

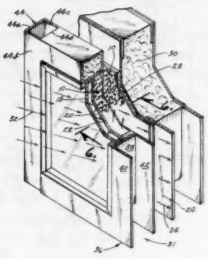
sorbing and reradiating plates of progressively increasing area from bottom to top of the hood.

3,863,621

SOLAR WALL SYSTEM

James L. Schoenfelder, Iowa City, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Aug. 31, 1973, Ser. No. 393,593
Int. Cl. F24j *3/02*
U.S. Cl. 126—270 **16 Claims**



1. A solar wall system comprising,

an exteriorly exposed transparent member,

a collector plate, adapted to be exposed to solar energy, interiorly disposed with respect to, and spaced apart from, said transparent member to define a first void space between said transparent member and said collector plate,

said collector plate having a plurality of openings and having a mass equal to solid plate of like material, wherein said openings increase the total surface area of said collector plate as compared to a solid plate of like material, a second void space behind said collector plate for collection and movement of warm air, and

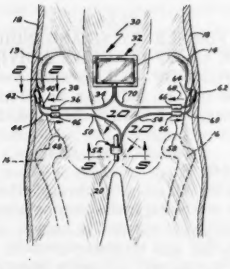
a most interiorly disposed wall structure element, said second void space being defined by said collector plate and said wall structure element.

3,863,622

INCONTINENCE SYSTEM AND METHODS OF IMPLANTING AND USING SAME

Robert Enno Buuck, 2350 Wisconsin Ave., Golden Valley, Minn. 55427

Filed Jan. 9, 1973, Ser. No. 322,221
Int. Cl. A61f *1/00*; A61b *17/00*
U.S. Cl. 128—1 R **6 Claims**



1. A method of implanting an incontinence system in an animal body comprising the steps of placing at one location within said body a cuff device having a deformable wall so that said wall resides in a proximal relation with a vessel having a passage extending therethrough which passage is to be opened and closed, placing at a second location within said body a pump bulb having fluid communication with said cuff device, said second location being spaced from said first location and sufficiently near the inner surface of the animal's skin so that said bulb can be squeezed through the skin to force fluid under pressure into said cuff device, placing at a third location within said body spaced from said second location a reservoir having fluid communication with said pump bulb for storing at least some of said fluid which is to be pumped into said cuff device by the squeezing of said bulb, placing a first check valve between said reservoir and said pump bulb and a second check valve between said pump bulb and said cuff device, said first check valve permitting fluid flow only from said reservoir to said pump bulb and said second check valve permitting fluid flow only from said pump bulb to said cuff device, placing within said body a second pump bulb at still another location spaced from said cuff device and from said first pump bulb, and also third and fourth check valves, said third check valve being between said cuff device and said second pump bulb and said fourth check valve being between said pump bulb and said reservoir, said third check valve permitting fluid flow only from said cuff to said second pump bulb and said fourth check valve permitting fluid flow only from said second pump bulb to said reservoir, each check valve including a plug member and a coil spring urging its said plug member in a direction to prevent fluid flow, the coil spring in said second check valve having a greater strength than the spring in said fourth check valve, and said spring in said fourth valve having a greater strength than the springs in said first and third check valves.

5. An incontinence system for implanting within an animal body comprising an inflatable cuff unit for circumscribing the vessel to be opened and closed, a reservoir for storing at least some of the fluid to be supplied to said cuff unit, a pair of elastomeric bulbs, a first check valve connected between said reservoir and one of said pump bulbs for permitting fluid flow only from said reservoir to said one pump bulb, a second check valve between said one pump bulb and said cuff unit for permitting fluid flow only between said one pump bulb and said cuff unit, a third check valve for permitting fluid flow only between said cuff unit and the other of said pump bulbs, a fourth check valve for permitting fluid flow only from said other pump bulb to said reservoir, a coil spring contained in each of said check valves, said fourth check valve containing a coil spring having a greater spring constant than the coil springs contained in said first and third check valves, and the coil spring in said second check valve having a greater spring constant than the coil spring contained in said fourth check valve.

3,863,623

METHOD FOR MICROSCINTIGRAPHIC EVALUATION STUDIES

Jon H. Trueblood; Roger M. Rossomondo, and William H. Carlton, all of Augusta, Ga., assignors to Medical College of Georgia Foundation Inc., Augusta, Ga.

Filed June 19, 1972, Ser. No. 264,372
Int. Cl. A61b *6/00*
U.S. Cl. 128—2 A **16 Claims**

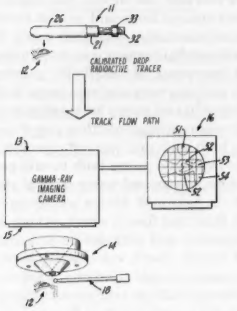
1. The method of microscintigraphic evaluation of the flow of the body fluids through defined flow paths adjacent to the surface of the body, comprising

situating a drop of radioactive liquid of calibrated minimal volume in the flow path upstream of the area to be evaluated,

positioning a micropinhole collimator in close proximity to said area and with said area in its operative field,

passing radiation emitted from said drop of radioactive liquid at said area through said micropinhole collimator onto the receptor of a gamma ray imaging camera to provide a visual display of sufficient resolution to deline-

ate successive positions of said radioactive liquid in said flow path, and



observing in said visual display passage of said drop of radioactive liquid being carried along said flow path within said area to determine physical characteristics thereof.

3,863,624

VACUUM CURETTAGE DEVICE

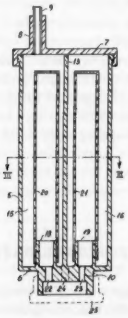
Hans Gram, 737 Strandvejen, Klampenborg, Denmark

Filed Dec. 3, 1973, Ser. No. 421,286

Claims priority, application Denmark, June 15, 1973, 3322/73

Int. Cl. A61b *10/00*

U.S. Cl. 128—2 B **5 Claims**



1. A vacuum curettage device comprising:

a curette including an elongated tubular shank having an inlet opening adjacent the outer end thereof;

a rotatable lid having connected eccentrically thereto said curette;

an elongated reservoir having at an inlet thereof said rotatable lid and in the interior of which a vacuum can be created by fitting to an outlet thereof a vacuum hose;

said reservoir having at least two compartments, each communicating one at the time with said curette in appropriate positions of said rotatable lid; and

each compartment being fitted with a filter partition separating said inlet from said outlet to intercept solid particles removed by the curettage.

3,863,625

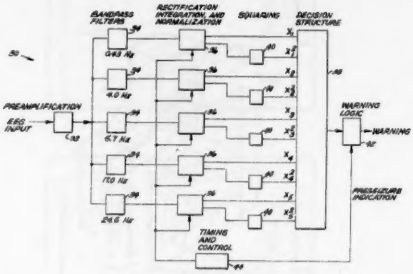
EPILEPTIC SEIZURE WARNING SYSTEM

Sam S. Viglione, Anaheim; Vladimir A. Ordon, Long Beach; William B. Martin, Newport Beach, and Carl C. Kesler, Jr., Fountain Valley, all of Calif., assignors to The United States of America as represented by the Secretary Department of Health Education and Welfare, Washington, D.C.

Filed Nov. 2, 1973, Ser. No. 412,496

Int. Cl. A61b *5/04*

U.S. Cl. 128—2.1 B **12 Claims**



1. A warning activation system comprising:

means for providing an electrical signal characteristic of the condition of a component part of a subject;

means for preprocessing said electrical signal to transform it into a predetermined format;

means for processing said transformed signal to measure energy characteristics thereof;

means for detecting predetermined features indicative of a relatively early abnormal condition of said component part of said subject, when predisposed to occurrence of an impending and disturbing event, from said measured energy characteristics of said transformed signal;

means for deciding from said detected features the condition of said component part of said subject and providing an output of a predetermined category for said abnormal condition thereof;

means for controlling said processing means to process said transformed signal reiteratively over successive sampling epochs thereof whereby decisions on the condition of said component part of said subject can be made for said epochs by said decision means; and

means responsive to the output of said decision means for providing an activation signal in advance of the occurrence of said event when said decision means output is of said predetermined category for at least a predetermined number of said epochs within an immediately preceding predetermined period.

3,863,626

APPARATUS FOR SURVEYING AND INDICATING THE PHYSICAL EFFORT OF AN INDIVIDUAL

Anton Huber, Waldhofstr. 40, Langenthal, Switzerland

Filed Dec. 13, 1972, Ser. No. 314,884

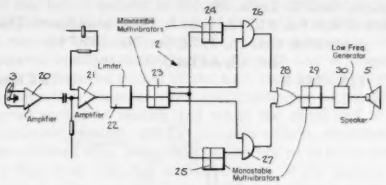
Claims priority, application Switzerland, Sept. 7, 1972, 13134/72

Int. Cl. A61b *5/04*

U.S. Cl. 128—2.06 F **14 Claims**

1. Apparatus for surveying the physical efforts of a person, said apparatus comprising pulse sensing means, means for generating impulses in response to outputs from said pulse sensing means, first and second monostable multivibrators having means for separately adjusting their respective delay times for establishing high and low limit frequencies and being connected to be actuated by said impulses, first and second gate circuit means each having a first input connected to receive said impulses and each having a second input con-

nected, respectively, to an output of said first and second monostable multivibrators, a signally means andd means connecting said signalling means for adjustment of same accord-



ing to the outputs from either of said gate circuits, said monostable multivibrators including means for maintaining both said gate circuits closed for the duration between their respective delay times.

3,863,627

MOUTH EXPLORING DEVICE

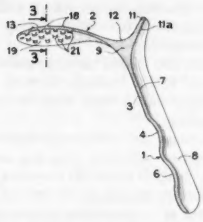
Pierre Bouffard, 13, Avenue de Dorirdan, St. Cheron, France

Filed Nov. 1, 1972, Ser. No. 302,924

Claims priority, application France, Nov. 5, 1971, 71.39807

Int. Cl. A61b *1/24*

U.S. Cl. 128—10 **8 Claims**



1. A device for depressing the tongue and exploring the inside of the mouth, comprising a handle, and a tongue depressing and mouth exploring strip having a rear part connected to the handle adjacent an upper end of handle in the position of use of the device, a front part, two curved convex lateral edge portions which extend from said rear part to said front part and define in said front part a substantially V-shaped notch which has curved convex flanks so that the strip has a generally heart-shaped profile in plan in the position of use of the device, the strip extending continuously between said lateral edge portions and between said front part and rear part, the strip having in the position of use of the device with the handle extending downwardly from the strip a slightly curved convex upper surface substantially throughout the strip in longitudinal and transverse directions of the strip and having a lower surface which is concave and slightly curved with a substantially constant curvature in said longitudinal and transverse directions so that it substantially corresponds to the shape of the part of the tongue the device is to depress.

3,863,628

DENTAL TREATMENT METHOD AND APPARATUS

Jaroslav Vit, Belle Mead, N.J., assignor to National Patent Development Corporation, New York, N.Y.

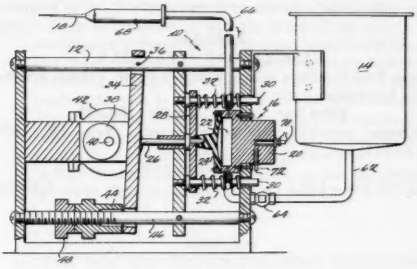
Continuation-in-part of Ser. Nos. 301,071, Oct. 26, 1972, abandoned, and Ser. No. 301,074, Oct. 26, 1972, abandoned. This application Dec. 6, 1972, Ser. No. 312,507

Claims priority, application Great Britain, June 12, 1972, 27445/72; Aug. 24, 1972; 39588/72; Aug. 24, 1972, 39589/72; Aug. 24, 1972, 35590/72; Sept. 5, 1972, 41194/72

Int. Cl. A61h *9/00*

U.S. Cl. 128—66 **8 Claims**

1. Apparauts of the type described comprising means defining a pump chamber including a flexible diaphragm mounted for movement between a first limiting position wherein said pump chamber is of maximum volume and a second position wherein said pump chamber is of minimum volume, power driven cam and cam follower means operatively connected with said diaphragm for effecting a cyclic movement of said diaphragm consisting of a movement from said first position to said second position through a pressure stroke and a movement from said second position to said first position through a suction stroke at a frequency of the order of 100 to 1,600



cycles per minute in which said diaphragm is maintained in said first position during each cycle for a period of the order of 30 to 90 percent of the total period of each cycle, suction conduit means for communicating a source of liquid to said pump chamber, check valve means in said suction conduit means permitting flow of fluid through said conduit means to said chamber but preventing flow in the opposite direction, outlet nozzle means, and pressure conduit means communicating said pump chamber with said outlet nozzle means.

3,863,629

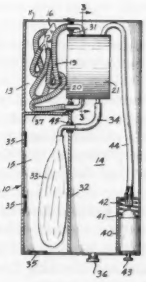
LIFE SUPPORT SYSTEM AND REBREATHER

Gordon E. Ries, 4423 Third Ave. East, Bradenton, Fla. 33505

Filed Apr. 9, 1973, Ser. No. 349,008

Int. Cl. A61m *16/00*

U.S. Cl. 128—142 **1 Claim**



1. In a closed cycle, low pressure, life support system and rebreather, a hollow case embodying first, second and third compartments therein, flap portions for gaining access to the interior of said case, there being an air vent establishing communication between the outside atmosphere and said third compartment, a port establishing communication with the atmosphere and said second compartment, a hollow cannister mounted in said second compartment having a quantity of air purifying material therein, first and second diametrically opposed fittings connected to said cannister, one-way check valves disposed in said first and second fittings for directing flow in one direction through said cannister, a face mask removably mounted in said first compartment and said face mask closing only the nose and mouth of the user, straps

connected to said face mask, a flexible bag mounted in said third compartment, a conduit connecting said bag to said cannister, a pair of flexible hoses connecting said face mask to said first and second fittings, said case defining and providing a back pack to be mounted and worn on the back of a user, an oxygen container arranged in one of said compartments, a manually operable means for selectively actuating the oxygen container to release oxygen therein, and a conduit connecting said oxygen container to said cannister.

3,863,630

RESPIRATORY APPARATUS

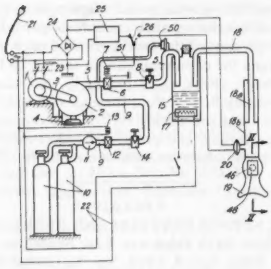
Roger Paul Charles Cavallo, Bourg-la-Reine, France, assignor to Synthelabo, Paris, France

Filed Nov. 7, 1972, Ser. No. 304,486

Claims priority, application France, Nov. 10, 1971, 71.40291; Oct. 11, 1972, 72.35928

Int. Cl. A61m *16/00*

U.S. Cl. 128—145.6 **6 Claims**



1. A respiration apparatus comprising:

a multistage air-displacement turbine pump having a discharge side;

an electric motor connected to said pump for driving same;

a first pipe connected to said discharge side of said pump;

a mouthpiece connected to said first pipe and receiving air from said pump through said first pipe;

an adjustable first throttle valve along said first pipe between said discharge side of said pump and said mouthpiece for controlling the airflow to said mouthpiece;

an electromagnetic flow-control valve along said first pipe between said discharge side and said throttle valve for selectively passing and blocking flow of air to said mouthpiece from said turbine pump;

means for periodically opening and shutting said flow-control valve;

a safety valve communicating with said first pipe for connecting said mouthpiece to the atmosphere upon pressure in said first pipe upstream of said flow-control valve falling below a predetermined level and indicating a failure at said pump;

another pipe connected to a source of oxygen under pressure and communicating with the first-mentioned pipe between said flow-control valve and said discharge side of said turbine pump; and

a further throttle valve in said other pipe between said source and said first pipe, said electromagnetic valve constituting the sole valve for flocking and unblocking flow of air and oxygen to a patient.

3,863,631

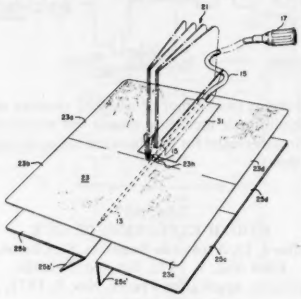
METHOD OF APPLYING AND SECURING A NEEDLE

Brian E. Baldwin, Wilmette, Ill., assignor to Affiliated Hospital Products, Inc., St. Louis, Mo.

Division of Ser. No. 42,713, June 2, 1970, abandoned. This application Oct. 16, 1972, Ser. No. 297,794

Int. Cl. A61m *5/00*

U.S. Cl. 128—214 R **13 Claims**



7. The method of applying and securing a needle and folded adhesive bandage assembly to a body having a puncturable securing surface, comprising

holding said needle and folded bandage assembly by manually grasping said folded bandage thereof,

inserting said needle into a body while manually grasping said folded bandage,

unfolding said bandage and adhesively removably adhering a pressure-sensitive adhesive securing surface of said bandage to said body in generally covering relation about the zone of insertion of said needle into said body by and through removal of a protective cover sheet from said adhesive surface, to removably secure said needle in place on said body,

said removal of said protective cover sheet being effected by manually holding said assembly in place at the zone of said puncture while pulling on and peeling back an edge portion of said protective cover sheet and also exerting an adhering pressure component on the thus uncovered adhesive securing surface of said bandage to thereby effect substantially interdependent removal of said protective cover sheet and adhesive securing of said bandage to the adjacent facing surface of said body.

3,863,632

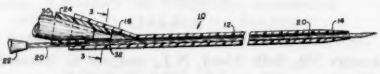
INTRACORPOREAL CATHETER ASSEMBLY

Boris Schwartz, 400 Park Ave., Paterson, N.J. 07504

Filed May 29, 1973, Ser. No. 364,756

Int. Cl. A61m *5/32, 25/00*

U.S. Cl. 128—221 **8 Claims**



1. A single-channeled intracorporeal catheter having a receiving socket for connection to the distal end of a fluid conducting system for feeding, injecting and draining, said catheter and connection including: (a) a catheter member of flexible tubing having its intermediate portion formed with a relatively constant bore, said catheter having a distal end of tapered configuration and having its other end secured in a fluid-tight manner to a hub having a tapered socket terminating at and connecting to this bore, the size of the socket progressively increasing as it approaches and reaches the open

end of the hub and having the axis of this tapered socket disposed at a divergent angle to the bore of the catheter so that the inner surface of one side portion of the tapered socket of this hub is parallel to the axis of the catheter bore; (b) a tubular intermediate member of semirigid material and having a residual bias and having both a tapered bore and an outer tapered configuration which mates with and is snugly fitted into the tapered socket of the hub, the tapered bore of said intermediate member sized and configured to provide a tapered socket to receive and retain the distal end of a fluid conducting system, and (c) a needle slidably mounted within the catheter bore, this needle positioned so as to lay along and on that inner side wall surface portion of the tapered socket portion of the hub that lies in a common plane with the catheter axis, said needle having a sharpened point on its distal end, the outer diameter of the needle sized so as to be slidable in the bore of the catheter member, said needle when mounted in the catheter having a sufficient length to enable its midshaft to pass through the tapered socket of the hub and bore of the said catheter, the point of the needle extending beyond the distal end of the catheter while the needle is slidably retained between the outer surface of the intermediate member and the wall of the tapered socket of the hub, this needle midshaft displacing and to a degree compressing that inserted portion of the intermediate member adjacent the bore of the catheter, the angle divergence of the axis of the hub of the catheter and the mounted intermediate member from the axis of the catheter being sufficient for the shaft of the mounted needle to avoid interference with and permit ready seating and securing of the distal end of a fluid conducting system in the receiving socket of the intermediate member and as and after the needle is withdrawn from the bore of the catheter the intermediate member by its residual bias moves from its displaced condition and into a fluid sealing condition with the tapered socket formed with the hub.

3,863,633

COMPOSITION CONTAINING A SUBSTANCE SHOWING A TOPICAL EFFECT ON THE EYE, AND A METHOD OF PREPARING THE SAME

Emma Marta Ryde, and Jan Erik Ekstedt, both of Uppsala, Sweden, assignors to Pharmacia Aktiebolag, Uppsala, Sweden

Filed May 24, 1972, Ser. No. 256,243
Claims priority, application Sweden, June 4, 1971, 7221/71
Int. Cl. A61m *7/00, 31/00*
U.S. Cl. 128—260 **15 Claims**

1. A composition in the form of a solid lens-shaped body having at least one curved surface and softly rounded corners which is adapted for insertion in the cavity between the eye and surrounding tissue, said shaped body retaining its shape during the whole time of use and containing a substance having a topical effect on the eye, which composition comprises a mixture of

a. 5 – 60 percent of at least one lipophilic substance having a melting point of 37 – 75°C and being selected from the group consisting of higher hydrocarbons, waxes, fats and mixtures thereof that are physiologically acceptable in the eye cavity,

b. 5 – 40 percent of at least one water-soluble or water-swellable polymer in solid, finely divided form and being selected from the group consisting of dextran, lower hydroxy-alkyl dextran, carboxy-methyl dextran, lower hydroxy-alkyl cellulose, lower alkyl cellulose, carboxy-methyl cellulose, polyvinyl alcohol, dextrin, starch, polyvinyl pyrrolidone and polyalkylene glycols, the particle size of the solid polymer being less than approximately 150 microns,

c. 0.05 – 30 percent of at least one substance having a topical effect on the eye, being in solid, finely-divided form, with a particle size less than approximately 150 microns, and being selected from the group consisting of drugs for glaucoma therapy and substances showing a mydriatic effect,

d. 10 – 80 percent of at least one member of the group consisting of aliphatic monalcohols having 13 – 22 carbon atoms to serve as stabilizer for the mixture,

the percentages relating to percent by weight calculated on the total weight of the mixture, whereby when said solid shaped body is inserted in an eye cavity and comes into contact with tear fluid, the polymer set forth in (b) which comes into contact with the tear fluid dissolves into a viscous solution or gel-like envelope that acts as a lubricating envelope, which, in cooperation with the shape of the unit

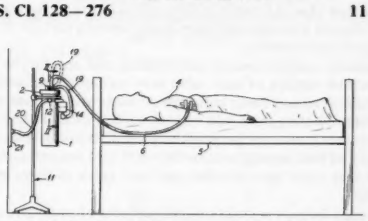
1. contributes to preventing mechanical irritation of the eye as a result of the shaped body and prevents the body from remaining in a specific position in the eye cavity, since it enables the unit to change position within the cavity,
2. forms a diffusion barrier for the drug or drugs for glaucoma therapy and therewith prevents a topical overdose with subsequent accompanying irritation, and
3. is free from difficulties with vision caused by ointment spread to the corneus tunic of the eye.

3,863,634

ASEPTIC SUCTION SYSTEM FOR BODY FLUIDS AND VALVE THEREFOR

Gordon S. Reynolds; Karl A. Pannier, Jr., and James L. Sorenson, all of Salt Lake City, Utah, assignors to Sorenson Research Co., Inc., Salt Lake City, Utah

Filed June 7, 1973, Ser. No. 367,831
Int. Cl. A61m *1/00*
U.S. Cl. 128—276 **11 Claims**



1. A body fluid receiving system for use in locations where bodies are worked upon, said system including a fluid receiver with means for connecting the interior of the receiver to the body being worked upon and also to a vacuum system, wherein the improvement comprises

a transparent housing in the vacuum line mounted so air passes through said housing from one end to the other drawn by the vacuum system, and

entrapment means in said housing to entrap fluid particles in a manner visible from a distance to denote to an observer that some body fluid has passed beyond the receiver,

said entrapment means including a deflector plate spaced inwardly from the inlet end of the housing and shaped to cause the air passing through to assume a vortex.

3,863,635

VACUUM HANDPIECE INCLUDING INTEGRAL VACUUM VALVE

Donald R. Swatman, Modesto, Calif., assignor to Den-Tal-Ez Mfg. Co., West Des Moines, Iowa

Filed Feb. 22, 1974, Ser. No. 444,709
Int. Cl. A61c *17/04*
U.S. Cl. 128—276 **10 Claims**

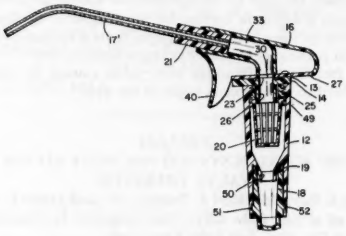
1. A vacuum valve comprising:

a. a valve seat member having a smooth surface of given contour and a passageway therethrough terminating in an aperture of given cross-sectional area in said smooth surface;

b. a valve slide member having a passageway therethrough and a smooth surface adapted to mate with said smooth

surface of said given contour of said valve seat member with a given tolerance, said smooth surface of said valve slide member having a first portion with an area larger than said given cross-sectional area of said aperture in said smooth surface of said valve seat member and a second portion penetrated by an aperture communicating with said passageway through said valve slide member;

c. means attaching said valve slide member and said valve seat member to each other with said smooth surfaces thereof in mating relation for slidable movement with respect to each other between a first position in which said first portion of said smooth surface of said valve slide member is aligned with said aperture in said smooth surface of said valve seat member and a second position



in which at least a part of said aperture in said second portion of said smooth surface of said valve slide member is aligned with said aperture in said smooth surface of said valve seat member;

d. annular resilient means surrounding said aperture in said smooth surface of said valve seat member, said annular resilient means being mounted on said valve seat member and projecting from said smooth surface of said valve seat member a distance substantially equal to said given tolerance of said mating relation between said smooth surfaces of said valve seat member and said valve slide member; and

e. means for moving said smooth surfaces of said valve slide member and said valve seat member with respect to each other between said first and second positions thereof.

3,863,636

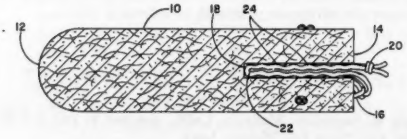
TAMPON WITH INTERNALLY PACKED WITHDRAWAL STRING

Carl W. Johnson, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 175,561, Aug. 27, 1971, abandoned. This application June 1, 1973, Ser. No. 366,126

Int. Cl. A61f *13/20*

U.S. Cl. 128—285 **9 Claims**



1. In a compressed tampon having a withdrawal string attached to one end thereof, the improvement comprising means for storing said withdrawal string in said tampon one end by being provided with an elongate open bore of small diameter extending longitudinally into the interior of said tampon for at least one-third of the tampon length; the diameter of said bore being less than the radius of said tampon; and the major portion of said string which extends between the attached and the free end of said string being packed and enclosed inside of said bore with sufficient tightness to be frictionally held therein until manually removed; said packed string being folded on itself at least once and the longitudinal axis of each of the longitudinal stretches of said folded string extending in the direction of the longitudinal axis of said bore; and a means for removing said major portion of said string from said bore comprising a minor portion of said folded string disposed outside the open end of said bore defining a free finger grasping end of said string.

3,863,637

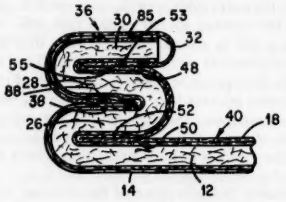
FOLDED DISPOSABLE DIAPER

Richard C. MacDonald, Rexdale; Noel E. Martin, Weston, Ontario, both of Canada, and Charles A. Lee, Knoxville, Tenn., assignors to International Paper Company, New York, N.Y.

Filed Dec. 8, 1972, Ser. No. 313,595

Int. Cl. A61f *13/16*

U.S. Cl. 128—287 **12 Claims**



1. In a disposable diaper having a rectangular outline and including an absorbent pad encapsulated between a backing sheet having an exposed surface and a liquid pervious cover sheet, the improvement wherein said cover sheet is wider than said pad and said backing sheet and defines longitudinal side extensions on opposite sides of said diaper, each of said side extensions being wrapped around the side edges of said pad and said backing sheet and bonded to said exposed surface of said backing sheet at a location spaced inwardly from the respective side edge of said backing sheet, each side edge of said diaper being folded along a longitudinal fold line inwardly toward the centerline of said diaper to define a first longitudinal fold, further folded along a second longitudinal fold line away from said centerline and back upon said first fold to define a second longitudinal fold, and further folded along a third longitudinal fold line inwardly toward said centerline and back upon said second fold to define a third longitudinal fold, whereby said side extensions of said cover sheet are exposed on the respective outer surfaces of said third longitudinal folds in position to cover that portion of said backing sheet disposed in the upperside of said third folds and thereby isolate said backing sheet from the skin of the person to whom the diaper is applied.

3,863,638

SHEATH ARRANGEMENT FOR MALE URINAL DEVICE

Crit H. Rogers, III, Natchitoches, La., and Joseph Sarto Rocheleau, Jr., Tiller, Oreg., assignors to Rogers Industries, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 331,683, Feb. 12, 1973, abandoned. This application Oct. 9, 1973, Ser. No. 404,346

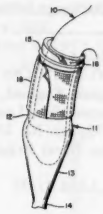
Int. Cl. A61f *5/44*

U.S. Cl. 128—295 **11 Claims**

2. A sheath arrangement for a male urinal device comprising:

a urinal sheath of flexible material designed for application to a penis for covering a substantial portion lengthwise of the same and having a connection means secured thereto for connecting the sheath through a suitable conduit to a urine receptacle, and

a liner pad of synthetic, resiliently compressible deformable waterproof material in the form of a strip of such material having a width sufficiently great to extend over a substantial portion lengthwise of a normal flaccid penis and of a length substantially greater than the circumference of



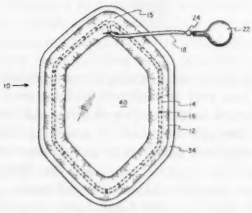
such a normal flaccid penis to enable the strip to be wrapped at least one and a half turns around the penis before application thereto of said sheath, at least the surface of the liner pad intended to be in contact with the penis being adhesive so that it tends to be held in place on the penis.

3,863,639

DISPOSABLE VISCERAL RETAINER

Richard N. Kleaveland, 426 Medical Center, Spokane, Wash. 99203

Filed Apr. 4, 1974, Ser. No. 457,906
Int. Cl. A61b *17/00, 19/00*
U.S. Cl. 128—303 R **22 Claims**



1. A collapsible retainer including means for temporarily retaining the body contents inside a patient during the suture of an incision following surgery, comprising:

a. a biologically sterile sheet of flexible, crushable material configured to fit within and beneath said incision;

b. an inflatable rib-like bladder formed in said sheet;

c. inflation means connected to said bladder for forcing gas into said bladder to render said sheet substantially flat and rigid; and

d. exhusting means connected to said bladder for releasing said gas therefrom to collapse said sheet.

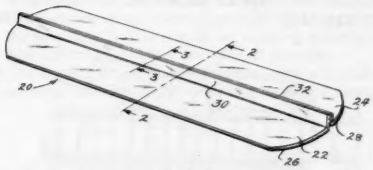
3,863,640

BANDAGE CONSTRUCTION

Charles B. Haverstock, 44 Frederick Ln., Glendale, Mo. 63122

Filed Apr. 27, 1973, Ser. No. 355,188
Int. Cl. A61b *17/04*
U.S. Cl. 128—335 **19 Claims**

1. A bandage for closing a wound comprising first and second strip portions of a relatively flexible material, each of said strip portions having a skin attaching surface and a flange formed of a flexible material extending along one side edge thereof, a coating of an adhesive substance applied to at least a portion of said skin attaching surfaces on each of said strip portions for attaching the said strip portions to the skin in spaced relationship to each other and along opposite edges of the wound, at least a portion of the adhesive substance on each of said strip portions extending to the side edges of the respective surfaces thereof which are to be attached along opposite edges of the wound, and cooperating engagable means including elongated male and female members extend-



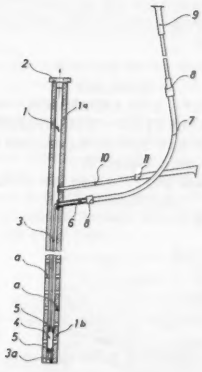
ing respectively along each of said flanges, said male member being movable into cooperative resilient engagement with the female member when pressure is applied against the respective flanges in a direction to press the male and female members together thereby to unite and hold the strip portions and the skin along opposite side edges of the wound together.

3,863,641

THORACIC DRAINAGE CATHETER

Ioan Pop D. Popa, Tirgu Mures, Romania, assignor to Institutul Pentru Creatie Stiintifica Si Technica, Bucharest, Romania

Filed Sept. 26, 1973, Ser. No. 400,798
Claims priority, application Romania, Sept. 29, 1972, 72375
Int. Cl. A61m *27/00*
U.S. Cl. 128—350 R **1 Claim**



1. A self cleaning catheter for thoracic drainage comprising:

a catheter tube body having an end provided with lateral orifices and adapted to be received in a thoracic cavity, and another end having means connectable to a suction source;

means for selectively closing the tube comprising a semi-rigid tubular mandrel extending laterally into said tube and having an inflatable end and sized to slide along the wall of said tube along said orifices; and

a syringe connected to said tubular mandrel for distending and collapsing the inflatable end thereof;

a rigid tube extending laterally from said catheter tube and communicating with the interior thereof having means for being connected to a graduated cylinder for flushing the catheter tube with a heparine solution when the tube is closed by the end of the mandrel in its inflated state.

3,863,642

OBSTETRIC DEVICE FOR ANIMALS

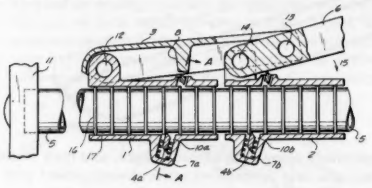
Werner Weiland, Bendorf-Sayn, Germany, assignor to Rheintechnik Weiland & Kaspar OHG, Bendorf, Germany

Filed July 2, 1973, Ser. No. 375,848

Claims priority, application Germany, July 4, 1972, 2232713

Int. Cl. A61b *17/42*

U.S. Cl. 128—352 11 Claims



1. An obstetric device for use with animals, particularly cattle and the like, comprising an elongated member having an end adapted to abut an animal giving birth; at least two members individually shiftably mounted on said elongated member and each adapted to be connected with an animal being born; control means for effecting individual movement of said shiftable members in a direction away from said end so that a tension may be continuously exerted on the animal being born when said shiftable members are connected with the latter to thereby aid the birth process; holding means for preventing movement of said shiftable members in a direction towards said end; and means for substantially simultaneously releasing said two shiftable members comprising release means coupled with said control means and operable by the same for disengaging said two shiftable members for sliding movement in a direction towards said end, whereby in case of emergency the tension exerted on the animal being born may be quickly released.

3,863,643

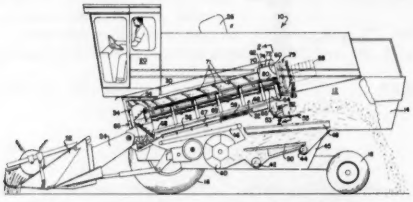
DISCHARGE CHUTE AND EXPANSION CHAMBER FOR AN AXIAL FLOW-TYPE COMBINE

Richard A. DePauw, East Moline, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed June 29, 1973, Ser. No. 375,249

Int. Cl. A01f *12/44*

U.S. Cl. 130—27 T 12 Claims



1. In an axial flow combine, in combination, an elongated generally cylindrical rotor casing defining a front crop-impelling region, a crop-threshing region, a crop-separating region, and a rear crop residue-expansion region therealong, successively and in the order named, a rotor disposed within said casing in coaxial relationship and substantially coextensive therewith, cooperating crop-impelling, crop-threshing and crop-separating instrumentalities on said rotor and casing in said impelling, threshing and separating regions respectively, the lower portion of said rotor casing in said residue expansion region being provided with a downwardly opening discharge outlet for crop residue, the wall of said rotor casing in said crop residue expansion region being displaced radially outwardly along substantially its entire three hundred and sixty degree circumference from the extended generally cylindrical confines of the casing in the adjacent crop separating region, thus defining an expansion chamber for the crop residue issuing from such latter region and flung from the rotor, whereby such residue may assume a state of equilibrium and fall by gravity through said discharge outlet.

3,863,644

SMOKING ARTICLES

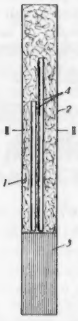
Frederick J. Hunt, Southampton, England, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Oct. 6, 1972, Ser. No. 295,453

Claims priority, application Great Britain, Oct. 21, 1971, 49023/71

Int. Cl. A24d *01/02*

U.S. Cl. 131—9 4 Claims



1. A smoking article comprising a rod of smoking material and a filter at one end of said rod, at least two combustible tubes of small cross section, open at each end, and extending longitudinally through the rod of smoking material from points closely adjacent the filter to points short of the end of the rod of smoking material opposite the filter, said tubes being of different lengths, the ends of said tubes located at the end of the rod opposite said filter being positioned at such different distances from said rod end so that a programmed air ventilation effect is achieved whereby during the initial puffs a mixture of air and tobacco smoke is delivered through the tubes providing a delivery of a higher TPM smoke to the filter than that which would be delivered in the initial puffs during smoking of the same tobacco column without inclusion of the tubes, and during successive puffs, the ratio of air to tobacco smoke in said mixture is increased as the fire cone moves through the tobacco rod to the ends of the tubes.

3,863,645

PROCESS FOR TREATING TOBACCO

Tien C. Tso, Beltsville, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 11, 1974, Ser. No. 478,417

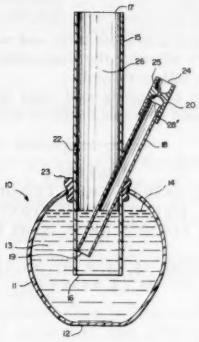
Int. Cl. A24b *15/04*

U.S. Cl. 131—17 R 7 Claims

1. A process for improving the combustion properties of cured leaf tobacco and for decreasing the amount of components associated with human health problems in the smoke of cured leaf tobacco comprising treating said cured leaf tobacco by applying to the tobacco a substance selected from the group consisting of $CH_3(CH_2)_nCOOCH_3$ in which n is a number from 4 to 12, $CH_3(CH_2)_nCH_2OH$ in which n is a number from 4 to 12, and mixtures thereof, said substance being

applied in an aqueous mixture containing a combination emulsifier and surface active agent and then bulking the treated leaf tobacco.

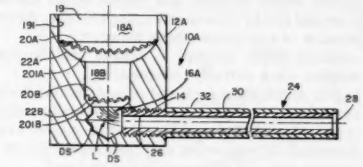
3,863,646
SMOKING DEVICE
Richard W. Kahler, Clinton, Md., assignor to Surf and Psych, Inc., College Park, Md.
Filed May 4, 1973, Ser. No. 357,186
Int. Cl. A24f *1/30*
U.S. Cl. 131—173 **3 Claims**

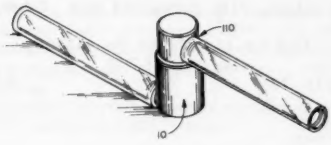


1. A smoking device comprising:
a chamber for maintaining a volume of fluid and having means defining a first opening within said chamber;
first smoke conducting means disposed within said first opening means of said chamber and defining a first open end means inserted into said chamber so as to extend within said fluid and a second open end means extending outwardly from said chamber;
second smoke conducting means also disposed within said first opening means of said chamber and defining a first open end means inserted into said chamber so as to extend within said fluid and a second open end means extending outwardly from said chamber, said first smoke conducting means also being inserted through means defining a second opening within said second smoke conducting means;
means surrounding said first and second smoke conducting means providing a seal for said chamber opening means adjacent to said second opening in said second opening of said second smoke conducting means, and
a smoking bowl connected to said second open end means of said first smoke conducting means for retaining smoking tobacco and permitting smoke to pass into said first smoke conducting means,
whereby said smoke passing into said first means is drawn through said fluid and directed out through said second means.

3,863,647
PIPE SMOKING
Richard A. Unger, 30 Bay State Rd., Rm. 928, Boston, Mass. 02215
Filed Dec. 22, 1972, Ser. No. 317,383
Int. Cl. A24f *5/08*
U.S. Cl. 131—179 **5 Claims**

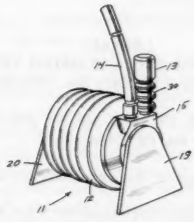
1. A two pipe assemblage of similar pipes of different bowl sizes, each of said pipes comprising,
means for forming a pipe bowl comprising a metal block with first and second intersecting passages therein arranged orthogonally with respect to each other,
a first one of said first and second passages being enlarged at a surface of the block compared to the other of said passages to form a bowl,
means forming a transition section annular shoulder within said bowl,
screen means overlying and seating on the annular shoulder with screen edges in frictional engagement with bowl side walls to prevent the screen's falling out and spanning the cross section of said bowl to contain smoking material in the bowl and limit access of the smoking material to the intersection of said first and second passages,
means forming an elongated pipe stem with a lip end and a securing end engageable with said bowl and comprising





means forming a central metal tube with smooth interior surfaces having a minimum cross-section area equivalent to a .200 inch diameter cylinder and a surrounding insulating jacket,
the pipe further comprising means demountably securing the securing end of said pipe stem to the second of said first and second passages,
the two pipes being nested with confronting bowls, one in the other, to form a total air flow passage comprising in sequence the tube lip end, tube, first and second passage intersection of one of the pipes and then through a volume defined by the overlapping bowls and then through the first and second passage intersection, tube and tube lip end of the other pipe.

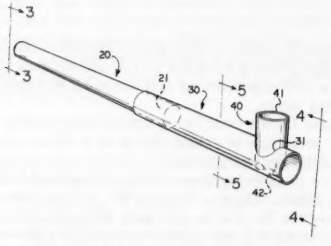
3,863,648
BELLOWS SMOKING PIPE
Glenn Thomas Cathey, 1106 E. Saginaw, Lansing, Mich. 48906
Filed May 2, 1974, Ser. No. 466,207
Int. Cl. A24f *13/04*
U.S. Cl. 131—186 **3 Claims**



1. In a smoking device, the combination comprising:

a. a resilient, partially collapsible flexible bellows body member defining a smoke expansion cooling chamber therein, said bellows body member provided with a smoke inlet check valve and a smoke outlet check valve in open communication with said cooling chamber;
b. A smoke generating bowl externally provided on said bellows body member in association with said smoke inlet check valve, said smoke generating bowl adapted to supply smoke through said smoke inlet check valve into said smoke expansion cooling chamber during expansion of said bellows body member;
c. a mouth member in association with said smoke outlet check valve, said mouth member adapted to receive cooled smoke through said smoke outlet check valve from said smoke expansion cooling chamber during compression of said bellows body member;
d. resilient means adapted to expand said flexible body member when partially collapsed; and
e. handle members at each end of said bellows body member adapted to be manipulated to partially collapse the same, said handle members having means extending therefrom for supporting said smoking device on a horizontally disposed substantially flat surface.

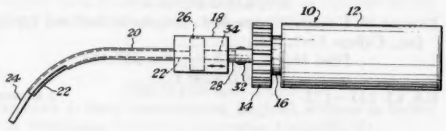
3,863,649
SMOKER'S PIPE
Ralph S. Scharfy, 3226 Collingwood Blvd., Toledo, Ohio 43610
Filed Feb. 14, 1974, Ser. No. 442,600
Int. Cl. A24f 7/02
U.S. Cl. 131—192 **4 Claims**



1. A smoking pipe comprising a hollow, generally elongate, tubular stem including a wall of preselected thickness, said wall including means providing an aperture, generally normal to the axis of said stem, and a bowl member of hollow configuration for receiving tobacco, said bowl snugly, slidably and removably fitting into said aperture means and also having means providing communication between the interior of the bowl and the interior of the stem, said bowl member having an inside configuration congruent to the outside of said stem member, permitting slidable reception of the extremity of said stem, whereby said bowl may be telescopically carried on the terminal end of said stem.

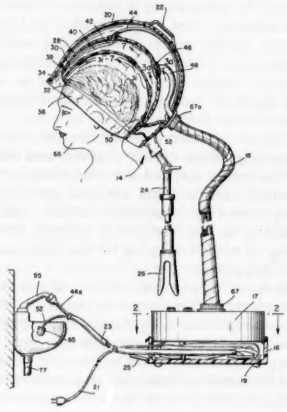
3,863,650
VARIABLE DEPTH HAIR COLORING APPLICATOR
Louis De Maria, 1191 S.W. Sixth Ave., Deerfield Beach, Fla. 33441
Filed Sept. 19, 1973, Ser. No. 398,711
Int. Cl. A45d 1/00
U.S. Cl. 132—9 **2 Claims**

1. A comb dispenser for dyeing human hair uniformly comprising:
a fluid receiving container means for receiving dye;
a plurality of elongated hollow teeth, each of said teeth having a slotted free end portion longitudinally disposed;
a plurality of flexible tubes, each of said tubes disposed in a different respective tooth and coupled moveably therein;
a support means connected to said teeth, said inner tubes, and said container;



means coupled to said inner tubes and said support means for moveably adjusting the longitudinal position of said tubes within said teeth; and
conduit means connecting said inner tubes and in fluid communication with said container means.

3,863,651
AUTOMATIC HAIR WASHER, CONDITIONER AND DRYER COMBINATION
Vincent Vaiano, 116-30 127th St., South Ozone Park, N.Y. 11420
Filed Nov. 15, 1973, Ser. No. 415,980
Int. Cl. A45d 1/00
U.S. Cl. 132—9 **10 Claims**

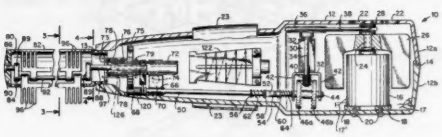


1. An automatic hair washer, conditioner and dryer comprising a base, a housing secured to said base, a post secured to said housing, a hood mounted on said post, a first semispherical shell spacedly mounted in said hood, a second semispherical shell mounted spacedly in said first shell and forming a chamber therebetween, means for supplying water to said chamber and the interior of said second shell, said second shell having a plurality of turbulence devices and a water outlet therein an air supply hose connected to said first shell soap supply means in said housing, soap and hair conditioner supply means in said housing, timing means in said housing for sequentially supplying water, soap, hair conditioner and air for drying a user's hair and blower means in said housing for forcing air into said second shell.

3,863,652
ELECTRICALLY DRIVEN HEATED HAIR CURLING OR SETTING DEVICE

Joseph P. Scivoletto, Brooklyn, N.Y., assignor to Malibu Personal Beauty Products, Inc., New York, N.Y.

Filed Aug. 31, 1973, Ser. No. 393,330
Int. Cl. A45d *24/00*
U.S. Cl. 132—11 A **8 Claims**



1. An electrically driven hair treating device comprising, in combination:

a. a first hollow housing;

b. a drive motor mounted in said first hollow housing, said drive motor including an output shaft;

c. a transmission system coupled to said drive motor through the output shaft thereof, said transmission system including an output pinion;

d. a drive gear rotatably mounted in said first housing and in meshing engagement with said output pinion for said transmission system;

e. a rotatable second hollow housing mounted in said first housing and coupled to said drive gear for rotation thereby, said second housing including at least one slot extending through the wall thereof;

f. a non-rotatable shaft having first and second end sections mounted in said first housing and said second housing, respectively, and a mid section positioned eccentrically with respect to rotational axis of said second housing;

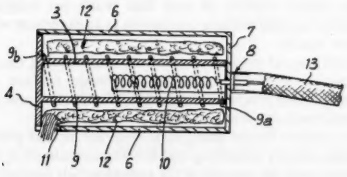
g. at least one hair treating member loosely mounted on said eccentric mid section of said non-rotatable shaft, the hair treating member being in alignment with and adpated to traverse said slot; and

h. means for selectively changing the direction of rotation of said housing.

3,863,653
METHOD FOR TREATING FIBERS BY SUBJECTING THEM TO HIGH FREQUENCY ELECTRIC FIELDS

Georges Boudouris, Grenoble; Gregoire Kalopissis, Paris; Jean-Luc Levesquf, Paris, and Paul Roussopoulos, Paris, all of France, assignors to Societe anonyme dite: L'Oreal, Paris, France

Continuation of Ser. No. 196,122, Nov. 5, 1971, abandoned.
This application Sept. 21, 1973, Ser. No. 399,420
Int. Cl. A45d *7/00*
U.S. Cl. 132—33 **10 Claims**

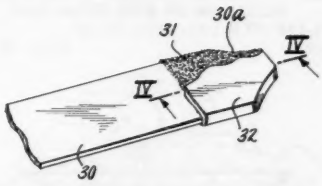


1. Process of treating fibers which comprises the step of subjecting them to the action of a high frequency electromagnetic field characterized by the fact that the fibers to be treated are placed in a resonator connected through a transmission line to a high frequency generator which generates electrical power at a frequency substantially equal to the resonant frequency of said resonator.

3,863,654
COSMETIC APPLICATOR

Bruno P. Morane, Paris, and Jean Boulogne, L Hay Les Roses, both of France, assignors to Societe anonyme dite: L'Oreal, Paris, France

Filed Jan. 15, 1973, Ser. No. 323,423
Claims priority, application France, Jan. 18, 1972, 72.01515; Dec. 11, 1972, 72.44054
Int. Cl. A45d *40/26*
U.S. Cl. 132—88.7 **1 Claim**



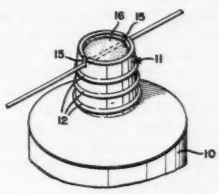
1. Cosmetic applicator comprising a flat strip of stiff material, one end of which is encircled by a thin layer of absorbent material adhesively secured thereto and having a substantially constant thickness, said layer being covered by a hard coating of lip rouge,

and comprising a thin coating of wax between said absorbent material and said lip rouge.

3,863,655
DENTRIFICE APPLICATOR METHOD

Richard K. Smith, 5500 Anne Ln., Dayton, Ohio 45459

Continuation of Ser. No. 181,184, Aug. 12, 1971, abandoned.
This application Jan. 2, 1974, Ser. No. 430,207
Int. Cl. A61c *15/00*
U.S. Cl. 132—91 **5 Claims**



1. A method for applying a measured amount of dentrifice to tooth surfaces between the teeth comprising;

a. selectively applying dentrifice to part of a length of dental floss by

1. manually pulling a length of dental floss from a dry sterile container,

2. inserting said dental floss, at a space from the leading end, between two opposed open-ended slots, each approximately 0.12 to 0.13 inches deep and approximately 0.04 inches wide, which are formed integrally in the outlet neck of a tube,

3. squeezing said tube until the toothpaste is at the upper edge of the neck, covering said dental floss, and

4. passing the intermediate length of said dental floss through said slots, thereby coating said intermediate length with a measured amount of toothpaste while leaving the leading end and trailing end of the floss free of toothpaste,

b. inserting the coated portion of said dental floss between the teeth, and

c. moving said dentrifice coated dental floss so as to deposit said measured amount of dentrifice to the tooth surfaces between the teeth.

3,863,656

APPARATUS FOR COOLING AND DRYING SOLID MATERIAL IN GRANULAR OR POWDER FORM

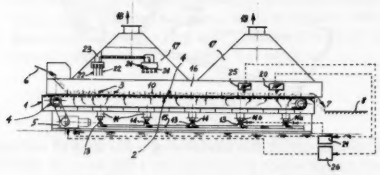
Gerhard Yves Richard, Precy sur Oise, France, assignor to Societe d'Application de Produits Industriels et Chimiques Sarl Departement SIGMA, Paris, France

Filed Nov. 30, 1971, Ser. No. 203,274

Claims priority, application France, Nov. 30, 1970, 70.43009

Int. Cl. B08b *3/02*

U.S. Cl. 134—57 R **5 Claims**



1. Apparatus for the continuous cooling of a powdery and/or granular solid material, such as foods, chemicals, minerals and foundry sand, to preferably room temperature and in a dry state, comprising:

a trough provided with at least one horizontal or substantially horizontal perforated plate,

conveyor means to move material deposited on one end of the said perforated plate along the perforated plate throughout the length thereof, the conveyor means including scrapers secured to an endless conveyor mechanism,

a fluidization channel extending throughout the length of the perforated plate,

air compressor means to direct an ascending flow of air upwardly through the perforations in the plate, the flow of air maintaining the said material in fluid suspension above the plate in the fluidization channel,

spray nozzle means for spraying a liquid onto the said material in fluid suspension to dissipate heat thereby;

a variable speed motor to drive said conveyor means,

the said scrapers being positioned perpendicular to their direction of movement with the scrapers and flow of air imparting a whirling motion to the material during travel to provide uniform cooling,

an outlet for the discharge of the material positioned adjacent one end of the said plate, and

a temperature sensor positioned upstream of said outlet to determine the temperature of the material, the temperature sensor being connected to the variable speed motor to regulate the speed of travel of the material as a function of its temperature.

3,863,657

DISHWASHER AND SINK COMBINATION

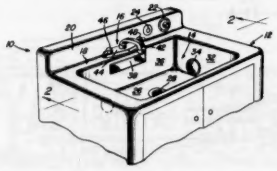
Willard Irving, P.O. Box 402, Dunbar, W. Va. 25064

Filed May 23, 1973, Ser. No. 363,109

Int. Cl. B08b *3/04*

U.S. Cl. 134—57 D **8 Claims**

1. In combination with a sink having a basin, a drain connected to the basin and a supply of water under pressure including a water outlet spigot, hot and cold water conduits and a manifold to which the spigot and the water conduits are connected, means for washing articles placed in the basin including receptacle means mounted on the basin for receiving water therefrom above a predetermined level, drain control means connected to the drain for selectively maintaining water in the basin and impeller means connected to the basin and the receptacle means for alternatively recirculating water



and inducing flow of air through the basin, said basin including bottom, side and back walls, the impeller means being connected to the side walls and the drain means to the bottom wall, said receptacle means being mounted on the back wall and in fluid communication with the basin through an opening in the back wall.

3,863,658

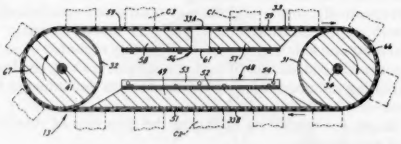
EMPTY CONTAINER WASHER

Kenneth D. Kramb, Portage; Richard L. Cramer, Kalamazoo, and Walter J. Isabell, Kalamazoo Township, Kalamazoo County, all of Mich., assignors to K.I.C. Incorporated, Kalamazoo, Mich.

Filed June 23, 1972, Ser. No. 265,504

Int. Cl. B65g *17/46;* **B67c** *1/06*

U.S. Cl. 134—131 **7 Claims**



1. A washing apparatus, particularly for washing magnetically attractable containers open at one end, comprising:

housing means;

conveyor means movable supported on said housing means for transporting containers, said conveyor means including a pair of spaced pulleys rotatably supported on said housing means and an endless conveyor belt extending between and supported on said pulleys;

said endless conveyor belt including first and second spaced and substantially parallel belt reaches extending between said pulleys;

first magnet means mounted on said housing means and positioned adjacent said first reach of said conveyor belt, said first magnet means being positioned closely adjacent the inside surface of said first reach for magnetically attracting and holding containers in engagement with said first reach;

second magnet means mounted on said housing means and positioned closely adjacent the inside surface of said second belt reach for magnetically attracting and holding containers on said second reach;

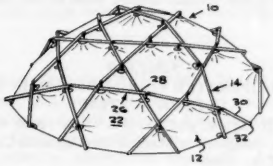
third magnet means associated with one of said pulleys for magnetically attracting and holding containers in engagement with the portion of the conveyor belt passing around said one pulley for permitting containers to be transferred between said first and second reaches;

fourth magnet means associated with said other pulley for magnetically attracting and holding containers in engagement with the portion of the conveyor belt disposed in engagement with said other pulley for permitting contain-

ers to be transferred between said first and second reaches; and

spray means including nozzle means positioned for spraying cleaning liquid into said containers when they are magnetically held on one of said reaches.

3,863,659
SHELTER STRUCTURE
Robert E. Gillis, R.R. No. 1, Golconda, Ill. 62938
Filed Mar. 19, 1974, Ser. No. 452,613
Int. Cl. A45f *1/16*
U.S. Cl. 135—4 R **9 Claims**



1. A shelter structure comprising:

a skin having an inner side and an outer side;

the skin having a series of apertures formed therein and extending therethrough;

a strut assembly comprising a plurality of strut members, with said strut members arranged in rows;

the strut members of each row being pivotally joined to one another at adjacent ends thereof, the rows being elongated;

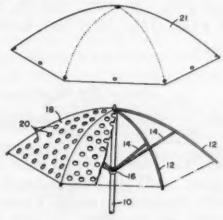
a first series of said rows in substantially parallel relation to one another, and a second series of said rows in substantially parallel relation to one another;

the first and second series of rows being interwoven with the respective struct members thereof passing sequentially above and below one another;

connectors depending from the strut members at spaced locations above the aperatures of the skins, said connectors including means engaged with the skins; and

spring means interposed between the skin and the strut assembly, the skin and strut assembly being mutually supportive of one another.

3,863,660
METHOD AND APPARATUS FOR CONTROLLING SUNLIGHT TRANSMISSION
Werner T. Glaeser, c/o Eltron Export Company, 159 Maiden Ln., Richmond, N.Y. 10038
Filed July 21, 1972, Ser. No. 273,852
Int. Cl. A45b *25/20*
U.S. Cl. 135—20 R **8 Claims**



1. An umbrella comprising,

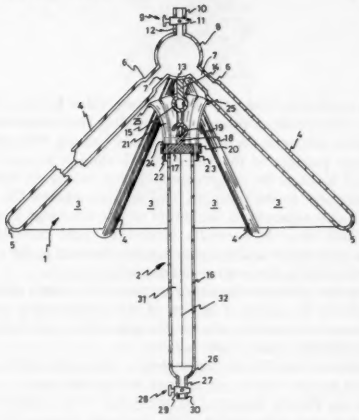
a central supporting pole,

cover supporting means extending about and supported by said supporting pole,

and cover means supported by said cover supporting means and including means defining a plurality of continuously open apertures free from material over substantially the entire surface of said cover means that transmit both sunlight and air therethrough for continuously exposing the user therebeneath to a portion only of the sunrays energy incident upon the top of said cover means and transmitting the flow of air therethrough,

the remainder of said cover means consisting of portions that alternate with said apertures for preventing the transmission of sunrays and air therethrough.

3,863,661
INFLATABLE UMBRELLAS
Carlos Mota Aburto, Donceles 86-1, Mexico
Filed May 21, 1973, Ser. No. 362,259
Int. Cl. A45b *19/02*
U.S. Cl. 135—20 B **9 Claims**



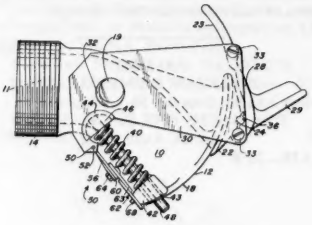
1. An inflatable umbrella which comprises, in combination, a foldable inflatable cone-like shield or cover member and a support member therefor, centrally engageable in supporting relationship thereto; said inflatable cone-like shield or cover member comprising a downwardly flaring cone-like panel, a plurality of radially evenly distributed elongated inflatable receptacles provided on said cone-like panel and forming a part thereof, said elongated inflatable receptacles having their outer ends closed and their inner ends adjacent the apex of said cone-like configuration being open, a plurality of inflation nozzle means integrally engaged to said open inner ends of said elongated inflatable receptacles, air distributing means connected to each one of said inflation nozzle means, said air distributing means being disposed on the outer top surface of said downwardly flaring cone-like panel in the region of the apex thereof, inflation air valve means connected to said air distributing means and hookable eye means extending downwardly from the inside center of said cone-like panel; and said support member comprising a body-engageable flexible member, a rigid circular plate means fixedly attached to one end of said body-engageable flexible member, hook means extending outwardly from the center of said circular plate means being engageable and disengageable with said downwardly extending hookable eye means of said inflatable cone-like shield or cover member and a plurality of strip-like stiffener members extending upwardly from the periphery of said circular plate means, said strip-like stiffener members when positioned against the undersurface of said cone-like shield or cover member when the latter is inflated extending beyond the reach of said hook means to bear against said undersurface and to thereby exert an opening pressure on said inflated cone-like shield or cover member.

3,863,662

FUSIBLE LATCH FOR HOLDING OPEN A SELF-CLOSING VISCOUS LIQUID DRUM VALVE

William J. Zehr, Des Plaines, Ill., assignor to The Protectoseal Company, Bensenville, Ill.

Filed Dec. 13, 1973, Ser. No. 424,468
Int. Cl. F16k *17/40*
U.S. Cl. 137—75 **3 Claims**



1. A guillotine-type, self-closing drum valve having a body with a cylindrically-arcuate seat and sliding shoe supported on side arms centered on a trunnion axis passing through the discharge passage of the valve, which shoe is eccentrically actuated to close by compression springs acting on the side arms adjacent to the trunnion, and reacting against the body of the valve adjacent to the outlet of the discharge passage, and which shoe is normally loaded by said compression springs to pressure seal the shoe against the seat in the closed position wherein the improvement comprises:

a. a halter pivotally mounted on one end in each side arm outside the point of action of the compression springs from the trunnion axis on the side arm, and extending outside the body of the valve;

b. a fusible link fixedly connected to the halter at the other end and having an aperture at its free end; and

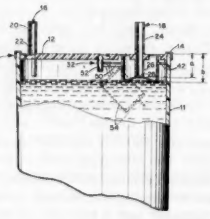
c. a pin fixedly mounted in the valve body adjacent the lower end of the outlet of the discharge passage for seating of the aperture of the fusible link thereon to hold the valve open against bias of the spring.

3,863,663

VACUUM FILLED LIQUID CONTAINER WITH CUT-OFF VALVE

Walter J. Bornhorst, Acton, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed May 17, 1973, Ser. No. 361,099
Int. Cl. A61m *1/00*
U.S. Cl. 137—205 **15 Claims**



1. A disposable vacuum operated liquid collection container adapted for use with a vacuum source, said container comprising in combination:

a. first means above the maximum liquid level for said container defining a fluid outlet port adapted for connection to the vacuum source;

b. Second means defining a liquid inlet for admitting liquid into said container by aspiration in response to action of an energized vacuum source connected to said outlet port;

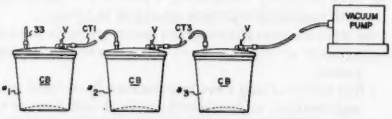
c. a unitary sealing member cup-shaped for buoyancy defining a surface for sealingly covering said outlet port; and d. flexible, unitary hinge means integral with said sealing member for mounting said sealing member internal of said container in operative position adjacent said outlet port, said hinge means permitting said member to depend below said port out of sealing position therewith and permitting movement of said member by floatation into said sealing position in response to a predetermined rise of liquid in said container, said member blocking communication to the vacuum source when in said sealing position.

3,863,664

VACUUM-OPERATED FLUID BOTTLES IN SERIAL FLOW SYSTEM

LeGrand K. Holbrook, and David S. Ostler, both of Salt Lake City, Utah, assignors to Medical Development Corporation, Salt Lake City, Utah

Division of Ser. No. 187,275, Oct. 7, 1971, abandoned, and a continuation-in-part of Ser. No. 876,438, Nov. 13, 1969, Pat. No. 3,620,408. This application Oct. 2, 1973, Ser. No. 402,750
Int. Cl. A61m *1/00*
U.S. Cl. 137—205 **2 Claims**



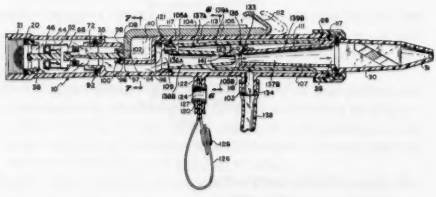
1. In combination, first and second fluid collection bottles each having a fluid inlet port, a free vacuum port, and a fluid-level controlled, valved vacuum port; a fluid inlet conduit connected to said fluid inlet port of said first bottle; conduit means for coupling said free vacuum port of said first bottle to said fluid inlet port of said second bottle; vacuum pump means; and conduit means connecting said valved vacuum port of said second bottle to said vacuum pump means, said valved vacuum port of said first bottle being selectively closeable.

3,863,665

ANTI-BACK-SIPHONING WATER SUPPLY VALVE AND MIXER

Valentine Hechler, IV., 26 Meadow View Rd., Northfield, Ill. 60093

Division of Ser. No. 333,309, Feb. 16, 1973, abandoned. This application Mar. 21, 1974, Ser. No. 453,290
Int. Cl. F16k *45/00*; **F04f** *7/02*; **G05d** *11/02*
U.S. Cl. 137—218 **18 Claims**



1. In a safety device for potable water supply and distributing system having a manually valved outlet;

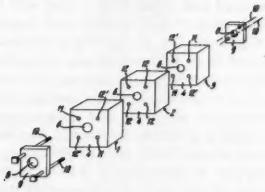
a housing defining a flow compartment connected releasably to the outlet having an inlet port, an outlet and a valve port opening to atmosphere disposed intermediate the inlet and outlet;
an inlet valve closing against the inflow of potable water at the inlet;
a vent valve in communication with said opening and opening inwardly to vent the compartment to atmospheric pressure;
means interconnecting and coordinating said valves to open one while closing the other; and
resilient means under pressure coacting with the interconnecting means to close said inlet valve when the opening force of supply water upon the inlet valve and the closing forces of water pressure in said compartment upon the vent valve drops below a predetermined gauge pressure.

3,863,666

ASSEMBLY FOR INSERTION IN A FLUID CONDUIT

Adam Bonne, and Jorgen Hogh, both of Copenhagen, Denmark, assignors to A/S Teknova, Niva, Denmark

Filed Aug. 1, 1973, Ser. No. 384,422
Claims priority, application Denmark, Aug. 8, 1972, 3907/72
Int. Cl. F16l *23/00*
U.S. Cl. 137—269 **1 Claim**



1. An assembly to be inserted into a fluid conduit comprising
first, second and third components to be inserted in series into the conduit, each component having opposite external surfaces having a port defined therein to allow fluid flow therethrough,
a clamping flange on each of two fluid conduit sections between which the components are to be inserted, and
a pair of bolts for each flange,
characterized in that
said second component has four threaded bolt receiving holes on each of its opposite surfaces circumferentially spaced around the respective port in each surface, the centers of the holes defining a square,
said first and third components each have a pair of bores therethrough opening in each of said opposite surfaces and a pair of threaded bolt receiving holes in each of said surfaces, the centers of the bores and holes on each surface defining a square with the bores being located at diagonally opposite corners, and
the bolts project through the flange and through the bores in said first and third components to engage the threaded holes in said second component.

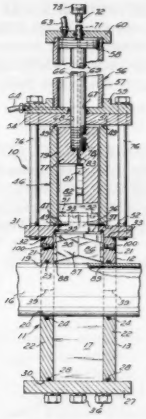
3,863,667

COMBINED SHEAR HEAD AND HOUSING PLUG

Gene T. Ward, Highland Heights, Ohio, assignor to The Pipe Line Development Company, Cleveland, Ohio

Filed Mar. 21, 1973, Ser. No. 343,505
Int. Cl. B23b *41/08;* **F16e** *41/04*
U.S. Cl. 137—318 **13 Claims**

9. Apparatus for controlling fluid flow in a conduit in service comprising a fluid tight housing adapted to be sealingly secured on the exterior of a section of conduit, cutter means in the housing, an actuator external of the housing for extending the cutter means radially into a wall of the conduit and retracting the cutter means from the conduit, said actuator being operable through an aperture in the housing, guide surfaces in the housing for guiding the cutter means along a direction substantially radial to the conduit, said guide surfaces being solely outside of a zone defined by a radial projection of said aperture, said cutter means having aperture sealing surfaces outward of and peripherally continuous around said zone whereby said cutter means is adapted to seal said aperture when it is retracted from said conduit to a position where said sealing surfaces engage a portion of said housing surrounding said aperture, and means to separate said actuator from said cutter means when said sealing surfaces of said cutter means are in sealing engagement with said housing portion surrounding said aperture.

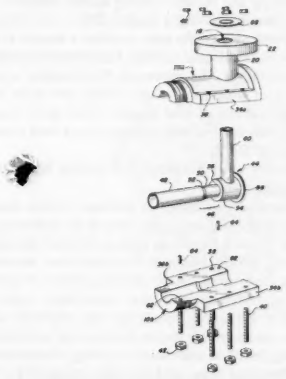


3,863,668

LINED FLUID FIXTURE

Frank J. Waters, Northridge, and Lawrence R. Good, Redondo Beach, both of Calif., assignors to Fansteel Inc.

Continuation of Ser. No. 198,153, Nov. 12, 1971, abandoned. This application Oct. 3, 1973, Ser. No. 403,321
Int. Cl. F16k *31/52*
U.S. Cl. 137—375 **18 Claims**



1. A corrosion resistant valve structure capable of withstanding internal pressures of 300 p.s.i.g. comprising:

a split valve body, said valve body defining therein a passage;

said body being formed by at least two interconnected separable body sections, said body sections being separable to provide access to said passage;

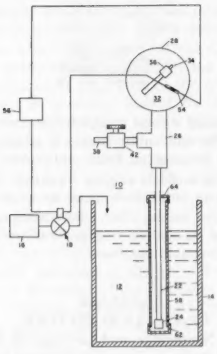
a one piece, integral, preformed, rigid, thin-walled generally tubular, corrosion resistant liner disposed within said passage, the configuration of the outer surface of said liner being substantially identical to the configuration of said passage, said outer surface of said liner being in intimate contact with the passage defining surfaces of said valve body to inhibit relative movement therebetween, whereby said liner is securely held against relative movement with respect to said valve body.

3,863,669

LIQUID NITROGEN LEVEL CONTROLLER

Takanobu Ishida, Staten Island; Anthony M. Popowicz, Brooklyn, and Joseph Glickstein, New York, all of N.Y., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed July 31, 1973, Ser. No. 384,326
Int. Cl. F16k *21/18*
U.S. Cl. 137—386 **3 Claims**



1. Apparatus for maintaining the level of cryogenic normally gaseous fluid which is at a liquefied temperature comprising:

a. means for containing the liquid forming a free surface;

b. gas thermometer means having a sealed fluid containing tube with an end extending into said container means for partial immersion in said liquid and the other end extending out of said container, the aforesaid fluid within said tube at a pressure at which said fluid within said tube is liquid at the temperature of said liquid within said containing means so that said tube contains vapor and condensed vapor of said fluid;

c. solenoid valve means upon actuation for adding liquid to said container means; and

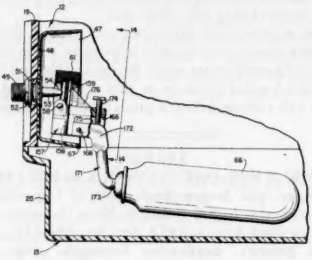
d. bourdon gauge means responsive to pressure within said tube having a magnetically operated switch for initiating said valve means to add liquid to said container means when the pressure within said gas thermometer means increases to a selected value due to declining level of said liquid causing vaporization of some condensed vapor therein, said valve means terminating the addition of liquid when said pressure decreases below said selected value due to rising level of said liquid causing condensation of vapor within said tube, said bourdon gauge means having a gauge pointer with a magnet thereon to energize and deenergize said switch upon reaching or receding from the aforesaid selected value, respectively.

3,863,670

HUMIDIFIER VALVE ASSEMBLIES

Richard J. Yeagle, 3823 Glen Hills Dr., Hartland, Mich. 48029

Continuation-in-part of Ser. No. 157,368, June 28, 1971, Pat. No. 3,774,588. This application May 24, 1973, Ser. No. 363,620
Int. Cl. F16k *31/24*
U.S. Cl. 137—437 **11 Claims**



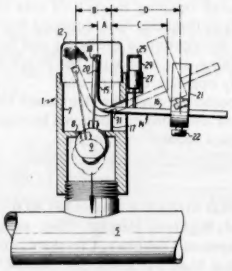
1. A valve assembly for a humidifier comprising an integral combined inlet conduit, discharge nozzle and shroud member formed of water resistant shape retaining plastic, said shroud being cup-shaped and comprising a rear wall from opposite sides of which project said conduit and nozzle in generally horizontal alignment and comprising a continuous side wall laterally spaced from said nozzle and projecting away from said wall beyond said nozzle, a valve support member pivoted directly on a pin extending between opposed shroud side wall portions for rockably mounting said valve support member for movement about a generally horizontal axis that is disposed below the level of said nozzle and at right angles to said nozzle, said valve support member having a lower portion projecting rearwardly out of said shroud, a depending float attachment arm mounted on said lower portion of the valve support member externally of said shroud and having means on its lower end for securing it to a float, and a valve element having a resilient face for engaging the open end of said nozzle mounted on said valve support member.

3,863,671

VACUUM REGULATOR CONTROL

Bernard Heimann, Washington, Mo., assignor to Zero Manufacturing Company, Washington, Mo.

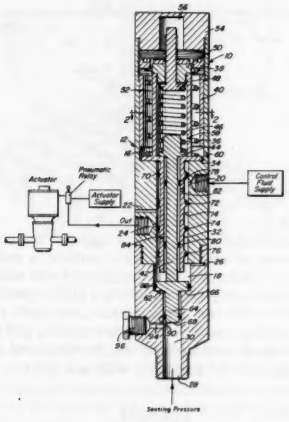
Filed Mar. 12, 1973, Ser. No. 340,298
Int. Cl. F16k *15/00*
U.S. Cl. 137—526 **8 Claims**



1. A vacuum regulator control for admitting air in a circuit under partial vacuum, comprising an inlet with a valve seat communicating with said circuit and a movable valve body positioned adjacent said seat to open and close same, an

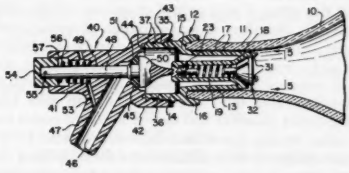
L-shaped lever member located above said seat and said member comprising an upwardly extending leg and a generally horizontal leg, said horizontal leg being supported on a fulcrum, said valve body being pivotably connected to the upper part of the upwardly extending leg at a location substantially above said fulcrum, said valve body being unseatable when the partial vacuum exceeds a predetermined amount and the pivot connection on said lever is moved to its lowermost position, said valve body being seatable in its uppermost position to maintain the partial vacuum in said circuit, said pivot connection being movable upwardly and in a non vertical direction towards said fulcrum, weight means on said horizontal leg, the position of said weight means being adjustable with respect to said fulcrum to vary the degree of partial vacuum needed to unseat said valve body.

3,863,672
DUAL ACTION PILOT
Gerold F. Theriot, Bourg, and Frank M. Hoofnagle, Houma, both of La., assignors to B.W.B. Controls, Inc., Houma, La.
Filed Sept. 6, 1973, Ser. No. 394,850
Int. Cl. F15b *13/042*
U.S. Cl. 137—596.18 **7 Claims**



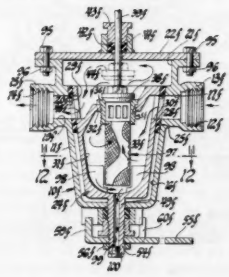
1. A pilot valve comprising a valve body, a bore within said body, first and second valve pistons movably disposed within said bore, said pistons being movable both as a unit and independently of each other, a control fluid inlet in communication with said bore, a control fluid outlet in communication with said bore, a control fluid bleed port, a pressure sensing inlet in said body, biasing means biasing said first and second valve pistons to a first position responsive to sensing of pressure below a predetermined minimum pressure where said control fluid inlet is blocked and said control fluid outlet is communicated with said bleed port, pressure means moving said first and second valve pistons as a unit to a second position responsive to the sensing of a predetermined pressure at said pressure sensing inlet, at which second position said control fluid inlet is communicated with said control fluid outlet and said bleed port is blocked, said biasing means comprises first and second compression springs respectively associated with said first and second valve pistons, the second spring being of greater rigidity than the first spring and maintaining said second piston in a fixed position relative to said first piston in said first and second positions, the first spring controlling movement of said first and second pistons as a unit from the first to the second position, said pressure means moving said first and second valve pistons to a third position responsive to sensing an excess of pressure at said pressure sensing inlet thereby causing a blocking of said control fluid inlet, said pressure sensing means comprising a unitary pressure piston positioned inwardly of said pressure sensing inlet and operatively engaged with said valve pistons, and including means for independently adjusting the biasing force of the first spring without affecting the force required to move the second piston from the second piston to the third position.

3,863,673
CONTAINER DISPENSER VALVE
Robert E. Sitton, 4829 Bay Ct., Tampa, Fla. 33611
Filed Apr. 11, 1973, Ser. No. 350,238
Int. Cl. B67d *1/12*; **F16k** *47/16*
U.S. Cl. 137—614.11 **5 Claims**



1. Container dispensing apparatus comprising stopper means to be selectively mounted on a container having fluid therein, said stopper means including a body having spaced first and second valve seats, first and second spaced valve members carried by said stopper means, resilient means connecting said first and second valve members and simultaneously urging said first and second valve members in opposite directions, said first valve member being urged by said resilient means toward said first valve seat and normally being in engagement therewith, said second valve member being urged away from said second valve seat by said resilient means, means for maintaining said second valve member in spaced relationship with said second valve seat, means for selectively operating said first valve member, and said second valve member being urged toward said second valve seat by fluid within the container when said first valve member is operated, whereby said second valve member controls the flow of fluid through said stopper means when said first valve member is operated.

3,863,674
FLUID FLOW CONTROL VALVE
Paul J. Scaglione, 30180 Richmond Hill Dr., Farmington, Mich. 48024
Filed Sept. 18, 1972, Ser. No. 290,259
Int. Cl. F16k *29/00*
U.S. Cl. 137—614.16 **7 Claims**



1. A fluid flow control valve comprising:
a. a valve body having a chamber therein;
b. an inlet passage communicating with said valve body chamber and an outlet passage co-axially aligned with

said inlet passage and communicating with said valve body chamber;

c. a seal mens operatively mounted within said valve body chamber and being operative to seal around the inner ends of said inlet and outlet passages;

d. a rotatable valve operatively mounted in said valve body chamber in sealing engagement with said seal means;

e. means for holding said rotatable valve in a constant wedging and rotatable sealing relationship with said seal means in all positions of the rotatable valve on the seal means and during rotation of the rotatable valve;

f. said rotatable valve being provided with a pair of chambers formed therein by a sloping dividing wall with one of said chambers comprising an inlet chamber having an inlet port communicating with said inlet passage and an outlet port in said sloping dividing wall communicating with the other of said pair of chambers which comprises an outlet chamber, and said outlet chamber having an outlet port co-axial with the inlet port of said inlet chamber and communicating with said outlet passage, whereby fluid entering said inlet passage will pass through said rotatable valve inlet chamber and into said rotatable valve outlet chamber and thence into said outlet passage;

g. valve means operatively mounted in said valve body chamber above the rotatable valve for regulating the flow of fluid through the outlet port in said dividing wall from said valve body inlet chamber into said outlet passage;

h. means mounted exteriorly on the lower end of the valve body in a position below the rotatable valve and releasably connected to said rotatable valve for rotating said rotatable valve to a first position to permit said flow of fluid from said inlet passage and through said rotatable valve to said outlet passage and to a second position whereby the flow of fluid between the inlet passage and outlet passage is blocked by said rotatable valve; and,

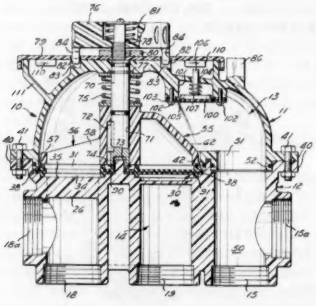
i. said means for holding said rotatable valve in a rotatable sealing relationship with said seal including a cam means mounted exteriorly of the valve body and operatively attached to said means for rotating said rotatable valve by gradual inclination toward the seal means to retain the rotatable valve in a further wedged and locked position when it is rotated to said second position.

3,863,675

POSITIVE INTERLOCK FOR A MULTIPORT VALVE

Arthur J. Wiltshire, Cleveland, Ohio, assignor to Pacific Fabrication, Inc., Chardon, Ohio

Filed Dec. 3, 1973, Ser. No. 420,957
Int. Cl. F16k *11/02*
U.S. Cl. 137—624.27 **4 Claims**



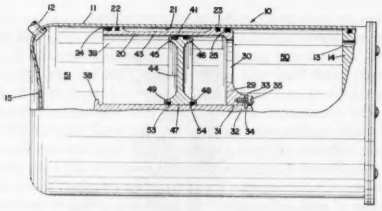
1. In a mulitport valve for selectively connecting a plurality of valve ports, comprising a valve body, a main pressure chamber defined by said body, inlet port means and a plurality of outlet port means in said valve body, and communicating with said chamber, valving means comprising a selector plate covering said outlet port means and having an aperture therein for providing selective fluid communication between said chamber and one of said outlet ports, and means for rotating said selector plate to provide said selective fluid communication, in combination therewith the improvement comprising pressure-responsive means fixed to said valve body and responsive to pressure in said chamber, and means responsive to said pressure-responsive means to lock said selector plate in a selected position and against movement in either direction when the pressure in said chamber is above a preselected value and to unlock said selector plate from its selected position when the pressure in said chamber is below said preselected value.

3,863,676

PISTON TYPE ACCUMULATOR

Manuel A. Tarsha, Santa Ana, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Apr. 23, 1973, Ser. No. 353,763
Int. Cl. F16l *55/04*
U.S. Cl. 138—31 **11 Claims**



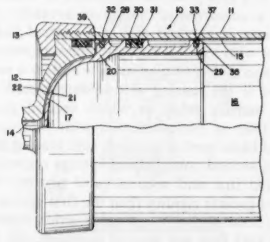
1. An accumulator comprising a cylinder closed at both ends and having an inner cylindrical surface, a main piston slidable in the cylinder in sealed engagement with said surface, said main piston having a bore forming a piston chamber open at each end to the interior of the cylinder, an axially extending cylindrical member mounted in the main piston, and an auxiliary piston slidably mounted on the member and in sealed engagement at its outer periphery with said bore.

3,863,677

ACCUMULATOR WITH COMBINATION GUIDE AND SEAL RING

Manuel A. Tarsha, Santa Ana, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Apr. 23, 1973, Ser. No. 353,795
Int. Cl. F16l *55/04*
U.S. Cl. 138—31 **4 Claims**



1. An accumulator comprising a shell having a cylindrical inner wall, a piston axially movable in said shell and dividing the interior of the shell into two chambers, a combination guide and seal ring carried by the piston at each end thereof

in slidable contact with said wall for guiding movement of said piston, each of said combination rings being adjacent a respective one of said chambers, said combination ring projecting radially outwardly of said piston whereby it maintains adjacent portions of the piston out of contact with said wall, a main seal ring carried by the piston between said combination rings and in sealing contact with said cylindrical inner wall, means for conducting fluid from each of said chambers past the respective combination ring to said main seal ring, an annular valve face at one end of the shell sealingly engageable with a transverse surface on one of said combination rings when said piston is moved to said one end of the shell to prevent flow of fluid between said chambers around said piston in the event said main seal ring fails to maintain sealing contact with said cylindrical inner wall.

3,863,678

PIPE GRATING STRUCTURE

Birger Pettersson, Alta, and Bo Sangfors, Ektorp, both of Sweden, assignors to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

Filed June 21, 1973, Ser. No. 372,022

Claims priority, application Great Britain, Aug. 11, 1972, 37557/72

Int. Cl. F16l *55/00*

U.S. Cl. 138—37 **6 Claims**

1. A grating structure adapted to be inserted in a conduit in order to homogenize a fluid flow passing therethrough, comprising a disc-like member traversed by passages which are arranged in parallel rows and which extend between the opposite major surfaces of the disc, the passages being curved and having inlet portions extending in a direction substantially parallel with the main direction of fluid flow over a distance which is substantial relative to the overall thickness of the disc-like member and having outlet portions communicating with respective inlet portions, the outlet portions of the passages of adjacent rows being inclined in opposite directions relative to the main direction of fluid flow through the disc.

3,863,679

PIPELINE ASSEMBLY

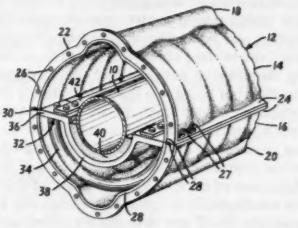
Joseph Young, Red Mill Rd., R.D. 2, Peekskill, N.Y. 10566

Filed Feb. 5, 1973, Ser. No. 329,532

Int. Cl. F16l *7/00*

U.S. Cl. 138—106 **13 Claims**

1. A pipeline assembly comprising:
   a. a pipe for conveying fluid material;
   b. a pipeline safety casing for receiving the pipe including:
      i. an elongated, tubular, corrugated casing body, and
      ii. A channel located adjacent the periphery of the casing body, the channel of the safety casing extending longitudinally along the casing body and communicating with the interior of the casing body to collect fluid material from within the casing body and to conduct the fluid material to a collection point; and
   c. carriers for supporting the pipe generally concentrically in the casing body, each carrier including:
      i. a generally semicircular seat part formed to fit closely an interior circumference of the casing body, and



      ii. A cradle part having an arcuate portion formed to fit closely an exterior circumference of the pipe, the seat parts of the carriers conforming to the corrugations of the casing body so as to restrain movement of the carriers longitudinally along the casing body.

3,863,680

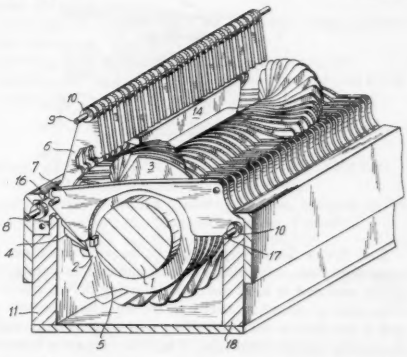
BEATING-UP DEVICE FOR LOOMS

Dmitry Vladimirovich Titov, 13 Parkovaya ulitsa 27, korpus 2, kv. 49; Nikolai Ivanovich Makachev, ulitsa Tsjurupy, 12, korpus 1, kv.27; Jury Pavlovich Sidorov, ulitsa Tsjurupy, 12, korpus 1, kv. 69; Tatyana Konstantinovna Filatova, B. Dorogomilovskaya, 31, kv. 290; Alexei Vasilievich Butuzov, Bolaklavsky prospekt, 38, kv. 61; Anatoly Grigorievich Selivanov, ulitsa Lobachevskogo, 44, kv. 59, all of Moscow, and Alexandr Mikhailovich Dyachkov, ulitsa Roschinskaya, 1, kv. 14, Klimovsk Moskovskoi oblasti, all of U.S.S.R.

Filed June 9, 1972, Ser. No. 261,544

Int. Cl. D03d *47/26*

U.S. Cl. 139—12 **3 Claims**



1. A beating-up device for looms, comprising: a drive shaft; toothed disks freely mounted on said shaft and movable translationally along said shaft, said disks being positioned angularly offset relative to each other so that their teeth form a helical surface, the teeth on each disk being grouped within an arc section of the disk, so that at the same time the addendum of one tooth is located at the fell of fabric, the addendum of another tooth entering between the warp threads of the shed section formed by the latter, said teeth on each disk having their heights increasing in the direction of the disk rotation, so that the first of the short teeth is adapted to shift the weft thread to the fell of the fabric and the last of the long teeth is adapted to beat it up; stationary separating plates having clearances therebetween for letting through the warp threads, each of said plates being mounted with a clearance relative to said disk and to the addendum of its tooth; auxiliary stationary plates having said disks placed therebetween, said auxiliary

plates entering the clearances between said separating plates for locating the disks opposite said auxiliary separating plates, the dedendum of said teeth coinciding with the axis of said shaft, the addendum of said teeth being formed along an arc by a single radius whose center coincides with the center of the addendum and being displaced relative to said axis of the shaft toward the beating-up tooth, the radius of the dedendum exceeding the distance between said shaft axis and the lower side of the shed but being less than the distance from said axis to the median line of said shed, the arc length at the addendum of the beating-up tooth having a magnitude so that at the beating up moment no more than four beating-up teeth are in simultaneous contact with the weft thread, and the arc length at the addendum of each successive tooth of the same arrow of teeth is substantially 3–7 mm and equals the length of the arc substantially 20–35 mm between the upper and lower sides of the shed as measured along the generatrix of the addenda of teeth as described by a predetermined radius.

3,863,681

DEVICE FOR DRIVING MOVABLE MACHINE PARTS IN REVERSE DIRECTION

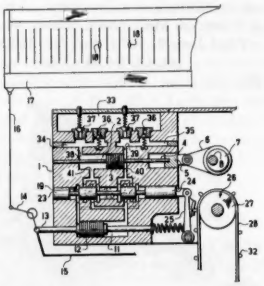
Pravomil Dostal, No. 910 U dubu, Tyniste nad Orlici, Czechoslovakia

Filed Jan. 22, 1973, Ser. No. 325,769

Claims priority, application Czechoslovakia, Jan. 20, 1972, 365-72

Int. Cl. D03c *13/00*

U.S. Cl. 139—55 **4 Claims**



1. A device for driving healds of weaving machines in reverse directions, comprising at least one double-acting driving piston unit and at least one double-acting driven piston unit, a by-passing circuit mutually interconnecting the two units, and a mechanism for controlling said by-passing circuit, the by-passing circuit comprising at least two separate branches of which each connects one point at one terminus of travel of the piston of the driving unit with two points at the termini of travel of the piston of the double-acting driven piston unit, a distribution sliding valve and a channel closed thereby mounted within the area of branching of the branches of said circuit, said channel mutually interconnecting both of said branches of the by-passing circuit, the branches of the by-passing circuit which are connected to the termini of the travel of the piston of the driving unit being provided at the points of mounting the distribution slide valve with pairs of parallel by-passing channels, in the center of each pair of said parallel by-passing channels there being by-passing channels of one branch of the by-passing circuit connected to one point at one terminus of travel of the piston of the driven piston unit, both sides of the said parallel by-passing channels of the other branch of the by-passing circuit being connected to the point at the other terminus of travel of the piston of the driven piston unit.

3,863,682

ELECTRICALLY OPERATED RACE FOR PRODUCING A TRAVELLING FIELD

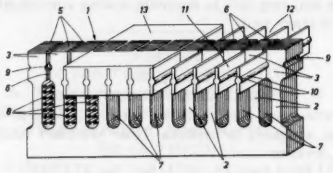
Walther Filter, Langenhagen, and Claus Filter, Rethem/Aller, both of Germany, assignors to Vereinigte Osterreichische Eisen-und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria and Etablissement Wanderfield & Co., Schaan, Liechtenstein

Filed July 16, 1973, Ser. No. 379,409

Claims priority, application Austria, July 27, 1972, 6455/72

Int. Cl. D03d *49/44*

U.S. Cl. 139—134 **6 Claims**



1. An electrically operated traveling field race for propelling a movable body along the race, the race comprising body propelling means consisting essentially of

1. a laminated iron core having a plurality of pole limbs defining slots therebetween and formed with pole heads having slot defining surfaces which define outer end portions of the slots, and
2. exciting electrically conductive winding means disposed in the slots and defining a plurality of poles each having a pole pitch and energizable to produce a magnetic flux emerging from the pole heads,
   a. whereby the race has a plurality of pole pitch portions each of which corresponds to one of the pole pitches and
   b. each pole pitch portion is adapted to be temporarily uncovered and at least partly covered by the movable body as it is propelled along the race,
   c. the pole heads having a height sufficient to enable the slot defining surfaces thereof to pass substantially the entire magnetic flux produced in any uncovered pole pitch portion between the outer end portions of the slots from pole head to pole head, and
   d. the reluctance presented to the magnetic flux passing through the outer end portions of the slots in any uncovered pole pitch portion exceeding the reluctance presented to the magnetic flux passing through the movable body in any at least partly covered pole pitch portion.

3,863,683

TIRE CORD FOR PNEUMATIC TIRES AND PNEUMATIC TIRES CONTAINING THE SAME

Raymond Guyot, Paris, France, assignor to Compagnie Industrielle de Textiles Artificiels et Syntheliques, Paris, France

Continuation of Ser. No. 777,128, Nov. 19, 1968, abandoned, which is a continuation-in-part of Ser. No. 396,308, Sept. 14, 1964, abandoned. This application Sept. 10, 1970, Ser. No. 71,250

Int. Cl. D03d *15/00*

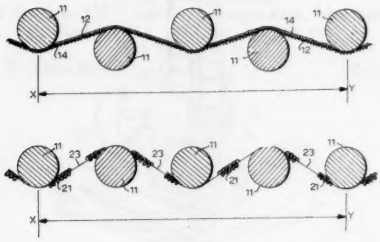
U.S. Cl. 139—426 R **5 Claims**

1. A method of preparing a woven fabric of parallel, equidistant cords for use in pneumatic tires comprising the steps of

weaving said cords as warp yarn with a composite weft yarn including a core yarn of low mechanical strength and a cover yarn helically wound around said core yarn, said cords being positioned in first and second planes after weaving with said composite weft yarn, and said core yarn having a length to maintain said cords in said first and

second plane positions in parallel, equidistant relationship; and

processing said woven cords to position said cords in a single plane, said core yarn being broken during said processing step due to tensile stress caused by increased length requirement to maintain said cords in said parallel,



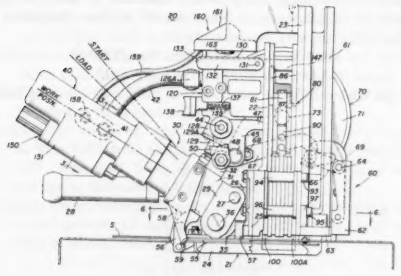
equidistant relationship exceeding said low mechanical strength of said core yarn and said cover yarn being straightened during said processing step and said cover yarn having a predetermined straightened length exactly equal to the length required to maintain said cords in said single plane in parallel, equidistant relationship.

3,863,684

STRAPPING TOOL

James R. Simmons, Frankfort, Ill., assignor to Interlake, Inc., Chicago, Ill.

Filed Nov. 23, 1973, Ser. No. 418,231
Int. Cl. B21f 9/02
U.S. Cl. 140—93.4 **15 Claims**



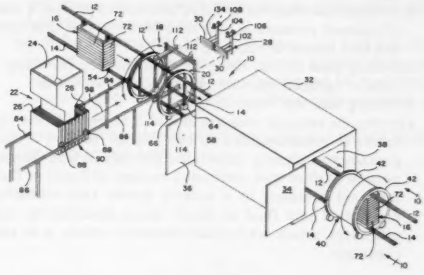
1. A strapping tool for applying a length of strap around an object in a loop with overlapping end portions, said strapping tool comprising tensioning means for tensioning the loop of strap about the object, sealing mechanism for sealing together the overlapped portions of the tensioned strap to secure the strap about the associated object, strap guide means movable between a retracted position away from the strap loop and a strap guiding position alongside the opposite side edges of both of the overlapped portions of the strap for limiting lateral movement of both of the overlapped portions of the strap while freely accommodating longitudinal movement thereof, and means for moving said strap guide means to the strap guiding position thereof at the initiation of operation of said tensioning means after the end portions of the strap have been placed in overlapping relationship and for moving said strap guide means back to the retracted position thereof after sealing of the tensioned strap, whereby said strap guide means insures that the end portions of the strap loop will remain in overlapping relationship during tensioning of the loop to facilitate the sealing thereof.

3,863,685

MONORAIL TRUCK TRAY LOADER

Ralph C. Parkes, Hancock & Lehigh Ave., Philadelphia, Pa. 19133

Filed July 10, 1973, Ser. No. 377,937
Int. Cl. B65b 1/04
U.S. Cl. 141—1 **22 Claims**



15. The method of loading material in granular form comprising the steps of

A. stacking a plurality of trays having open fronts horizontally in a tray truck;

B. moving the tray truck in an initial position into a tray loading station;

C. rotating the tray truck within the tray loading station to a loading position to face the open fronts vertically upwardly;

D. moving a plurality of filled measuring pockets into the tray loading station and vertically aligning the pockets over the open fronts;

E. dumping the material from the filled measuring pockets into the trays;

F. rotating the tray truck to a leveling position; and

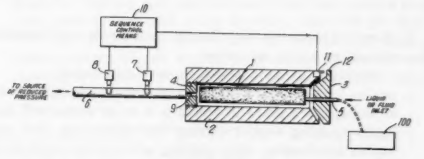
G. leveling the material within the trays when the tray truck is maintained in the leveling position.

3,863,686

APPARATUS AND PROCESS FOR ARTICLE FILLING UNDER REDUCED PRESSURE

Edward I. Klein, Montreal, Quebec, Canada, assignor to V-Mark Automation Ltd., Montreal, Quebec, Canada

Filed Oct. 16, 1972, Ser. No. 297,935
Int. Cl. B43k 11/02
U.S. Cl. 141—20.5 **2 Claims**



1. A method for adding a controlled amount of liquid or fluid to an absorbent article in an air tight container;

said container comprising first means being in airtight communication with a source of reduced pressure;

said container further comprising second means adapted to be placed in airtight communication provided under pressure;

wherein said first means comprises:

plug means in airtight engagement with said container at one end thereof, said plug means comprising an opening providing a communications path to said interior portion;

a flexible tube being in airtight connection with said plug adjacent to and surrounding said opening at said one end of said tube;

the other end of said tube being connected to said source of reduced pressure; and two spaced-apart clamp valves on said tube between said plug and said source of reduced pressure, comprising a first clamp close to said plug and a second clamp close to said source of reduced pressure; said method including the steps of activating said first clamp valve to close while said second valve remains open;

activating said source of reduced pressure to provide a zone of reduced pressure in said tube between said first valve and said source of reduced pressure;

activating said second valve to close thereby providing a zone of reduced pressure between said two valves;

activating said first valve to open;

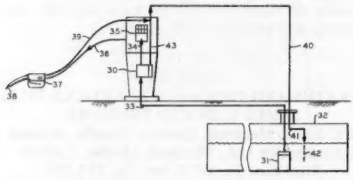
whereby the reduced pressure in said zone between the two valves is communicated to the interior portion of said container to thereby reduce the pressure in said interior portion to draw said controlled amount of liquid or fluid into said container by a sucking action, said controlled amount of said fluid or liquid being absorbed by said absorbent article while said absorbent article is in said container.

3,863,687

RETURN OF VAPOR CONDENSATE FORMED IN DISPENSING VAPOROUS LIQUID

Henry E. Alquist, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 4, 1972, Ser. No. 250,295
Int. Cl. B65b *31/00*
U.S. Cl. 141—45 **5 Claims**



1. A means for removing a liquid from a reservoir in which it accumulates which comprises:

a. a reservoir for the accumulation of said liquid;

b. means for pumping a liquid to be dispensed from a place of storage to a place at which it is to be dispensed, said liquid yielding vapors during this dispensing and said vapors condensing, thus yielding said liquid which accumulates in said reservoir;

c. a conduit means for conveying said liquid to be dispensed to a place for its dispensing through which said means for pumping a liquid pumps said liquid, thus creating a fluid pressure; and

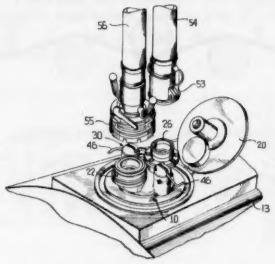
d. fluid pressure actuated means cooperatively functioning with said reservoir adapted to remove from said reservoir liquid accumulated therein and means operatively connected between said conduit means and said fluid pressure actuated means to transmit the pressure of said fluid in said conduit means to said fluid pressure actuated means.

3,863,688

CONVERTOR FOR TOP LOADING TANKS

James S. Millar, Fountain Valley, and Charles V. Gardner, Santa Monica, both of Calif., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed June 18, 1973, Ser. No. 370,682
Int. Cl. B65b *3/18*
U.S. Cl. 141—59 **16 Claims**



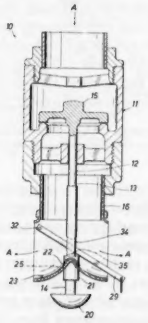
1. A convertor for use in filling a tank with liquid through an opening in the tank, the convertor including a closure plate sealingly engageable with the tank for closing said opening, latch means carried by said convertor and engageable with the tank for locking the closure plate to the tank, a fitting on said closure plate for receiving a flow line, and actuator means for said latch means movable between a release position in which the latch means interferes with the attachment of the flow line to said fitting and a lock position in which the latch means permits said attachment.

3,863,689

SPLASH PREVENTOR FOR TANK TRUCK LOADING RACK

Donald W. Lanning, Friendwood; Leonard J. Lambin, and John G. Pratt, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sept. 1, 1972, Ser. No. 285,946
Int. Cl. B65b *3/02*; **B67c** *3/02*
U.S. Cl. 141—115 **4 Claims**



1. A device for preventing splashes during tank filling operations, said device comprising:

a valve assembly including a check valve having a poppet with a shaft extending downwardly therefrom and a discharge port therethrough

a fluid deflector disposed at the lower end of the device adjacent the discharge port of said check valve and in line therewith;

means for connecting said deflector to said check valve; said poppet valve shaft including a shaft extension ex-

tending through said deflector and being connected at its upper end to said poppet shaft, said poppet shaft extension having a poppet shaft tip at its lower end; and

manually-operable drain lever means operatively engaging said valve shaft and extending to a point laterally outside said device for the operation of said valve.

3,863,690

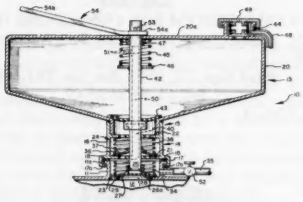
RADIATOR FILLER

John O. Dean, 370 N. 300 E., American Fork, Utah 84003

Filed June 11, 1973, Ser. No. 368,508

Int. Cl. B65b *3/18*

U.S. Cl. 141—364 **9 Claims**



1. A radiator filler comprising

a valve assembly including a valve housing;

connection means for coupling said valve housing into a cooling system of an internal combustion engine;

valve means within said valve housing for selectively opening and closing off fluid passage therethrough;

a filler tank housing having a depending neck portion;

means for connecting said depending neck portion to said valve housing above said valve means;

a filler opening in said filler tank housing through which liquid is introduced into said tank housing;

cap means for releasably closing said filler opening;

a filler tube slidably extending through said filler tank housing and into said neck portion;

filler tank means secured to said filler tube and arranged to close said filler tank neck portion to control liquid passage from said filler tank housing to said upstanding first housing around said filler tube;

means for coupling said valve means in said valve housing to said filler tube such that movement of said filler tube will open said filler tank valve means and said valve means in the valve housing; and

means for admitting pressure from said valve housing to an upper portion of said filler tank housing when said valve means in said housing is opened.

3,863,691

CONTOUR COPYING LATHE

Erich Schmidt, Wien, Austria, assignor to Maschinenfabrik Zuchermann Komm-Ges. Wien, Wien, Austria

Filed Mar. 7, 1973, Ser. No. 338,814

Claims priority, application Austria, Mar. 10, 1972, 2064/72

Int. Cl. B23b *3/28*

U.S. Cl. 142—7 **6 Claims**

1. A contour-copying machine comprising:

means for supporting a model and a workpiece rotatably about parallel respective model and workpiece axes;

means for rotating said model and said workpiece about their respective axes at a first peripheral speed;

means defining a pivot axis substantially orthogonal to said model and workpiece axes;

means for relatively displacing said pivot axis and said model and workpiece axes at a feed speed parallel to said model and workpiece axes;

a model arm swingable about said pivot axis and having a feeler and engageable with said model;

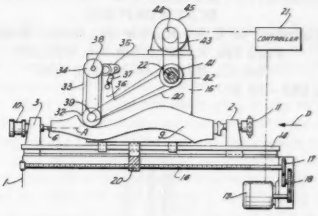
a workpiece arm pivotal about said pivot axis and angularly fixed to said model arm, said workpiece arm having a tool and engageable with said workpiece;

means for urging said feeler end and said tool end against said model and said workpiece, respectively;

a tool at said tool end of said workpiece arm rotatable about a tool axis transverse to said workpiece axis and parallel substantially to said pivot axis and comprising a rotatable drum, an endless sanding belt spanned over said drum, and means on said workpiece arm for maintaining said belt tight about said drum;

means for rotating said tool drum about said tool axis at a second peripheral speed many times greater than said first peripheral speed and said feed speed for machining said workpiece and reproducing therein the contours of said model;

means defining a second pivot axis transverse to said model and workpiece axes;



means for relatively displacing said second pivot axis and said model and workpiece axes at said feed speed parallel to said model and workpiece axes;

a second model arm pivotal about said second pivot axis and having a feeler end engageable with said model;

a second workpiece arm pivotal about said second pivot axis and angularly fixed to said second model arm, said second workpiece arm having a tool end engageable with said workpiece;

means for urging said feeler end and said tool end of said second arms against said model and said workpiece, respectively;

a second tool at said tool end of said second workpiece arm and rotatable about a second tool axis; and

means for rotating said second tool about said second tool axis, said second tool being disposed ahead of the first-mentioned tool with reference to the direction of relative displacement of said second pivot axis, said second tool having a coarser material-removal characteristic than said first tool.

3,863,692

BARK STRIPPING MACHINE

Yoshiaki Hasada, Asahikawa, Japan, assignor to Eho Industries Co., Ltd., Hokkaido, Japan

Filed July 27, 1973, Ser. No. 383,144

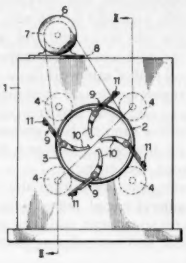
Claims priority, application Japan, Oct. 21, 1972, 47-104855

Int. Cl. B27l *1/00*

U.S. Cl. 144—208 E **4 Claims**

1. A bark stripping machine comprising a rotary drum and a plurality of knives, each of said knives having a cutting member at one end, a wing member at the other end thereof

and a weight detachably mounted on said wing member, said knives being mounted on the inner peripheral wall of said



rotary drum in such a manner that each said cutting member is pivotable toward the center of the rotary drum.

3,863,693

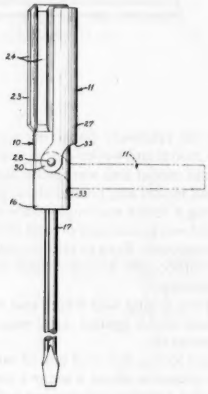
COMBINATION HANDLE AND HAND LEVER FOR SCREWDRIVERS

Roy I. Carriker, 95 E. Ice Harbor Dr., Pasco, Wash. 99301

Filed Feb. 4, 1974, Ser. No. 439,230

Int. Cl. B25b *15/02*; **B25g** *1/00*

U.S. Cl. 145—50 R **1 Claim**



1. A combination handle and hand lever for a screwdriver comprising:

an elongated handle body of electrically non-conductive material having a continuous semi-cylindrical peripheral surface extending between ends of said handle along one side of a central longitudinal handle axis and a hand-grip surface extending along the remaining handle surface on the other side of said axis;

socket means at one end of said handle for rigidly mounting a screwdriver shank coaxially with said handle axis;

a semi-cylindrical lever of magnetic metal pivotably mounted to the handle for free pivotal movement about a pivot axis perpendicular to and intersecting the handle axis and having a concave inner surface formed about a lever axis complementary to the semi-cylindrical peripheral surface of the handle and a convex outer peripheral surface concentric to the inner surface;

an abutment surface on the lever radially spaced from the pivot axis;

whereby the lever is pivotable to a closed position wherein the concave inner surface is located adjacent to and partially overlapping the semi-cylindrical peripheral surface of the handle with the lever axis and handle axis coaxial, and to an open position wherein the abutment surface is pivoted to engage the semi-cylindrical peripheral surface and the lever axis is substantially perpendicular to the handle axis; and

magnet means adjacent a remaining end of the handle for releasably securing the lever in the closed position:

said pivot axis being defined by a wrist pin extending through a complementary aperture in the handle body at a location thereon clear of the socket means to thereby electrically insulate the lever from a screwdriver shank.

3,863,694

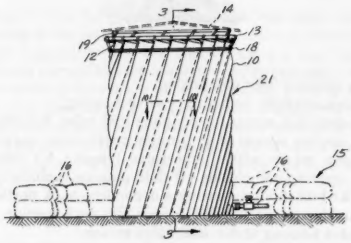
DEPLOYABLE SYSTEM FOR CONTAINING OIL SPILLS

Edwin N. Fisher, 7632 Wandering Dr., Anchorage, Alaska 99502

Filed Sept. 22, 1972, Ser. No. 291,255

Int. Cl. B65d *65/02*

U.S. Cl. 150—1 **9 Claims**



1. A deployable containment system for containing spills from a storage container, comprising:

a. a deployable substantially planar diaphragm formed of relatively flexible material and having a radial dimension substantially equal to the radial dimension plus the height of said container so that said diaphragm is capable of containing substantially the entire contents of said container;

b. said diaphragm disposed beneath said container and suspended from and extending substantially to the upper edge of said container; and

c. means for suspending said diaphragm from the upper edge of said container and holding said diaphragm substantially tightly against the outer surface of said container in the initially installed undeployed condition; so that any leak or spill of the contents of said storage container will be contained within said diaphragm and said diaphragm will deploy downwardly and expose the surface of said container as it becomes filled with said contents.

3,863,695

PNEUMATIC TIRES AND BREAKERS THEREFOR

Henri J. Mirtain, Compiegne, France, assignor to Uniroyal, a Societe Anonyme, Clairoix, France

Filed June 6, 1973, Ser. No. 367,468

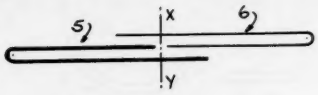
Claims priority, application France, July 6, 1972, 72.24526

Int. Cl. B60c *9/18*

U.S. Cl. 152—361 FP **13 Claims**

1. A pneumatic tire comprising a radial ply carcass having a crown region, a tread overlying said crown region, and a reinforcing breaker interposed between said tread and carcass, said breaker comprising a first folded ply having a fold region proximate one circumferential edge of said tread, and a second folded ply having a fold region proximate the other

circumferential edge of said tread, said fold regions of said first and second plies, respectively, dividing said plies each into a pair of webs, said webs of said first ply and said webs of said second ply cooperatively defining in cross-section a substantially S-shaped array wherein one web of said first ply and one web of said second ply lie in an intermediate mutual circumferential plane and have respective non-overlapping marginal edges confronting one another in spaced relation



which define an annular gap therebetween, said one web of said first ply having physical characteristics different from said one web of said second ply in said intermediate mutual circumferential plane, whereby said breaker displays asymmetrical physical characteristics relative to a median equatorial plane thereof at least in said intermediate circumferential plane, said first and second plies each including a plurality of reinforcing cords therein, the cords in said first ply having a greater diameter than the cords in second ply.

3,863,696

MINI-PLY IMPROVED PNEUMATIC TIRES

Lawrence R. Sperberg, 6740 Fiesta Dr., El Paso, Tex. 79912

Continuation of Ser. No. 102,023, Dec. 28, 1970, abandoned, which is a continuation of Ser. No. 695,932, Jan. 5, 1968, abandoned. This application Oct. 5, 1972, Ser. No. 295,142

Int. Cl. B60c *9/06*

U.S. Cl. 152—356 **13 Claims**

1. In a pneumatic tire having spaced beads, a tread portion, a main carcass ply which extends from bead to bead to form a sidewall and which supports the tread portion, with said sidewall including a shoulder area thereon, the improvement comprising:

two mini-plies for imparting structural rigidity into the main carcass ply; each of said mini-plies being comprised of an individual circumferentially extending reinforcing strip lying parallel to one another and adjacent to the main carcass ply;

each of said mini-plies being spaced apart from each other and from the equatorial plane of the tire and from the tire beads and positioned in the shoulder region so as to decrease the bend point in the shoulder area as the tire contacts a supporting surface;

each of said mini-plies including two superimposed oppositely biased individual plies of tire cord material disposed at unlike angles relative to the equatorial plane of the tire.

3,863,697

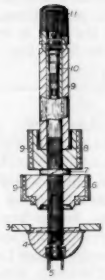
INSTANT VALVE INSERT

Roland Clough Brown, 425 Stratford Ct., Del Mar, Calif. 92014

Filed Dec. 17, 1973, Ser. No. 425,238

Int. Cl. B60c *29/00*

U.S. Cl. 152—427 **5 Claims**



1. In combination with an old valve plug as broken off from the old valve stem and remaining in the hole of the wheel flange of a vehicle with a tubeless tire, an instant valve insert, comprising a valve stem with a valve cap and a valve spring assembly, fitted on the said old valve plug in the said hole in the said wheel flange from the outside with air-tight clamping and locking means for securing the said valve insert to the said old valve plug at the opposite end of the said instant valve insert from the said valve cap, and fitted with air-tight anchoring means to assist the said clamping and locking means in securing the said old valve plug in the said hole in the said wheel flange of the said vehicle permanently and rigidly to the said instant valve insert.

3,863,698

CHAIR WITH A DETACHABLE SEAT

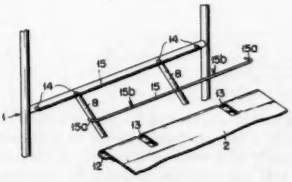
Suekichi Uchida, Aza Gonishi, Japan, assignor to Uchida Sharyo Co., Ltd., Nagoya-shi, Japan

Filed Jan. 4, 1974, Ser. No. 430,658

Claims priority, application Japan, Mar. 10, 1973, 48-30252

Int. Cl. A47c *5/06*

U.S. Cl. 160—327 **6 Claims**



1. A chair having a detachable seat comprising in combination

a. a frame assembly including a pair of side frames and a pair of lateral bars rigidly connected to the respective side frames, said respective lateral bars having a plurality of engaging holes longitudinally arranged in a line and spaced apart at predetermined intervals;

b. a seat having both sides doubled back to provide bag-like portions adapted to be wrapped around the respective lateral bars; and

c. a pair of fixing bars inserted into the respective bag-like portions of the seat and having two groups of engaging

projections projecting normal to the axis of the fixing bar and engaged in said engaging holes of the lateral bar;

d. said fixing bars, prior to assembly, having one group of the engaging projections differing in a relative angle from the other group of engaging projections so that, when the engaging projections of said one group are engaged with the respective holes of said lateral bars, the engaging projections of said other group are forced into the corresponding holes of said lateral bars, in a direction that the relative angle to the projections of said one group is decreased, whereby the seat is removably fixed to the lateral bar through the fixing bar.

3,863,699

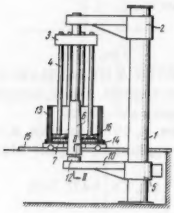
PLANT FOR THE ELECTROSLAG MELTING OF HOLLOW INGOTS

Boris Izrailevich Medovar, ulitsa A. Barbjusa, 22/26, kv. 109; Valery Evgenievich Lanevsky, ulitsa V. Kuchera, 2, kv. 8; Jury Fedorovich Alferov, bulvar Lepse, 29, kv. 64; Rudolf Solomonovich Dubinsky, Politekhnicheskaya ulitsa 5, kv. 209; Mikhail Elevich Berezovsky, ulitsa Lomonosova, 21/14, kv. 54; Leonty Vasilievich Chekotilo, ulitsa A. Barbjusa, 22/26, kv. 64; Leonid Viktorovich Pavlov, ulitsa Borschagovskaya, 234, kv. 6, all of Kiev; Veniamin Alexandrovich Ishunkin, ulitsa Tolbukhina, 7, kv. 142, Moscow; Anatoly Ivanovich Shevtsov, ulitsa Vorovskogo, 5, kv. 9, and Semen Yakovlevich Grinshpon, ulitsa Butova, 128, kv. 37, both of Kulebaki Gorkovskoi oblasti, all of U.S.S.R.

Filed Dec. 11, 1973, Ser. No. 423,750

Int. Cl. B22d *27/02*

U.S. Cl. 164—252 **2 Claims**



1. A plant for the electroslag melting of hollow ingots comprising a mast; a top carriage fastened to said mast so as to allow its transfer in a vertical direction; an electrode holder secured to said top carriage; a drive for carrying said top carriage; a cooled mold having a space for building up an ingot; a base plate mounting said cooled mold; said base plate being defined by a car provided with an opening in the zone of shaping the ingot space, horizontal guide bars in which said car is mounted; a bottom carriage fastened to said mast to allow its vertical transfer; a mandrel adapted to shape the ingot space, said mandrel being secured to said bottom carriage with the aid of a bracket and introduced into the space of said cooled mold through said opening in the base plate; and said mandrel having a base in which a ball-shaped support is secured intermediate of sockets mounted on said bracket of said bottom carriage to provide an angular deflection of said mandrel in relation to the longitudinal axis of said bracket for maintaining the vertical position of the mandrel.

3,863,700

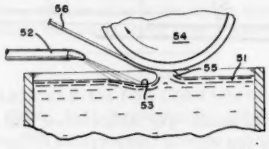
ELEVATION OF MELT IN THE MELT EXTRACTION PRODUCTION OF METAL FILAMENTS

John R. Bedell, (Lake Mohawk) Sparta, and John A. Wellslager, Mount Arlington, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed May 16, 1973, Ser. No. 360,887

Int. Cl. B22d *11/06*

U.S. Cl. 164—87 **12 Claims**



1. In a melt extraction method for the production of metal filaments from a molten reservoir wherein a quenching wheel is positioned contiguous to the melt and extracts a filament directly from the melt reservoir, the improvement comprising elevating a discrete amount of the melt directly from the melt reservoir to contact the quenching wheel by means of an auxiliary rotating hot wheel which is partially immersed within the melt thereby utilizing substantially the entire quenching capacity of said quenching wheel to quench said discrete amount of the melt.

3,863,701

PROCESS FOR MANUFACTURING HEAT-INSULATED CASTINGS

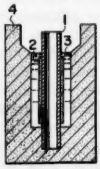
Itaru Niimi, Nagoya; Yasuhisa Kaneko, Toyota; Akiyoshi Morita, Toyota; Katumi Yagi, Toyota, and Hiromitu Kashiwagi, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Aichi-ken, Japan

Filed May 17, 1972, Ser. No. 254,228

Claims priority, application Japan, Jan. 17, 1972, 47-6738

Int. Cl. B22 *19/00*

U.S. Cl. 164—98 **4 Claims**

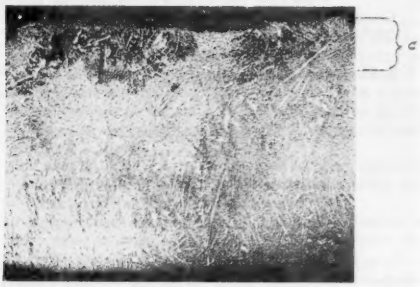


1. A process for manufacturing heat-insulated castings comprising the steps of providing a hollow metal core having resistance to heat and corrosion, applying a bonding agent to the outside of the core and thereafter coating a foamed alumina onto the bonding agent on the outside of the metal core, drying the thus obtained double structure at room temperature, and then at a temperature of approximately 250°C. for at least about 10 hours followed by drying at about 500°C. for several hours, positioning the double structure in a mold, and pouring molten metal into the mold to surround the double structure in a metal casting.

3,863,702
CENTRIFUGAL CASTING METHOD

William L. Hallerberg, and Gilbert W. Gordon, both of Kokomo, Ind., assignors to Cabot Corporation, Kokomo, Ind.

Filed Jan. 12, 1973, Ser. No. 323,104
Int. Cl. B22d *13/00*
U.S. Cl. 164—114 7 Claims

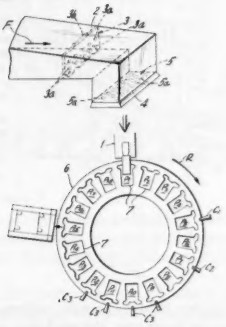


1. The method of centrifugally casting hollow metal objects comprising the steps of:
   a. casting molten metal into a rotating centrifugal casting mold,
   b. adding a molten self-disintegrating slag which on solid state transformation breaks up to said rotating centrifugal casting mold immediately after casting said molten metal therein,
   c. cooling said mold to solidify the metal and cause the slag to solidify and disintegrate, and
   d. removing the cast metal object from the mold and the disintegrated slag from the cast object.

3,863,703
METHOD FOR CASTING A LARGE LEAD ANODE PLATE

Yuki Nishimura, Takehara, Japan, assignor to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1974, Ser. No. 442,575
Int. Cl. B22d *25/04*, *35/04*
U.S. Cl. 164—128 7 Claims

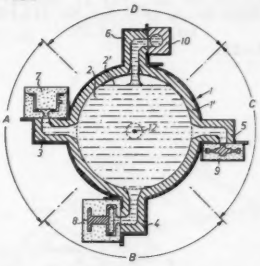


1. A method for casting a large lead anode plate comprising:
providing at least one open topped anode plate mold;
providing a pouring trough opening into said mold;
transporting melted crude lead through said trough at a temperature within the range of from about 340°C to 350°C;
reducing the velocity of the melt without decreasing the volume of flow of melt during pouring of the melt into said mold;
sequentially applying discrete first and second stages of water cooling to the melt surface and a third stage of water cooling to the back surface of the mold; and subsequently removing the cast plate from said mold.

3,863,704
METHOD OF CASTING BY POURING METAL FROM A MELT SUPPLY THROUGH A FEEDER INTO A MOLD

Freidhelm Kahn, 2, Muhlbachstrasse, 6332 Ehringshausen, Germany

Filed Jan. 2, 1973, Ser. No. 320,686
Int. Cl. B22d *33/02*
U.S. Cl. 164—130 10 Claims

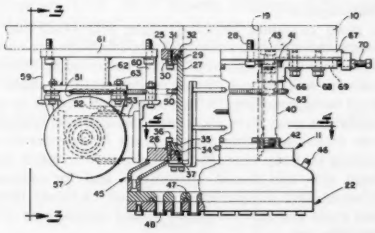


1. The method of producing castings by pouring melt from a melt supply into a mold through a feeder, comprising the steps of:
   a. moving said mold and said feeder in a circular orbit in a vertical plane about a given point;
   b. maintaining a level of said melt in said melt supply vertically above said given point;
   c. further moving said mold for solidification in said vertical plane through a plurality of positions relative to the direction of gravity having said feeder in connection with said melt below said given point for filling said mold through said feeder below said melt level; and
   d. removing said casting from said mold connected with said feeder after solidification.

3,863,705
SAND BLOW RESERVOIR FOR A FOUNDRY MOLDING MACHINE

Barry G. Leeson, Bay Village, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Oct. 17, 1972, Ser. No. 298,297
Int. Cl. B22c *15/24*
U.S. Cl. 164—202 12 Claims



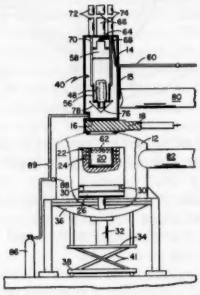
1. A sand blow reservoir for a foundry molding or core blowing machine wherein said reservoir is initially charged with sand which is subsequently blown from said reservoir into a mold or core box, said reservoir comprising a selectively rotatable housing and agitation means in said housing fixed with respect thereto, said housing being rotated during said blowing to assist the agitation means in maintaining the sand in said housing in a flowable condition, thereby uniformly to feed the sand to the mold or core box, said agitation means

including scraper arms mounted on one of said ends and positioned closely adjacent the interior of said cylindrical housing, and radially inwardly extending blades on said scraper arms.

3,863,706
METAL CASTING

George D. Chandley, and John N. Lamb, both of Amherst, N.H., assignors to Hitchiner Manufacturing Co., Inc., Milford, N.H.

Filed Dec. 4, 1972, Ser. No. 312,138
Int. Cl. B22d *27/16*
U.S. Cl. 164—255 **6 Claims**

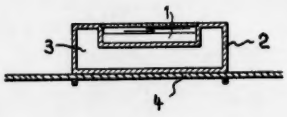


1. In casting apparatus having
a sealable melting and mold pouring chamber,
a sealable loading compartment mounted on said chamber and
valve and conduit means communicating between said chamber and said compartment
that improvement comprising:
a sealable mold container having a bottom opening for sealing around the lower open end of a gas permeable mold supported therewithin and extending downwardly therebeyond
said mold container including upper and lower cup elements movable into sealed relationship with one another a crucible in said chamber having surrounding induction coils for holding and stirring molten metal to cause outward surface movement thereof along its surface to carry impurities away from the central area of said crucible
power means including piston means independently supporting said cup elements from above for relative movement into said sealed relationship and for movement between said compartment and said chamber through said valve and conduit means to said central area of said crucible and
means for selectively varying the pressure of said chamber, compartment and container
to fill said mold after lowering said container with the lower open of said mold beneath the surface of molten metal in said central area of said crucible and
permit loading and unloading said mold from said container in raised position by relative movement of said cup elements within said compartment while maintaining the chamber pressure by closure of said valve and conduit means.

3,863,707
METHOD FOR STABILIZING THE TEMPERATURE OF AN INSTRUMENT, PARTICULARLY OF A WRIST WATCH

Johannes Geiss, Hinterkappelen, and Peter Eberhardt, Gumligen, both of Switzerland, assignors to OMEGA Louis Brandt & Frere S.A., Bienne, Switzerland

Filed Feb. 14, 1972, Ser. No. 225,772
Claims priority, application Switzerland, Feb. 14, 1971, 2729/71
Int. Cl. F28b *3/00*
U.S. Cl. 165—1 **5 Claims**

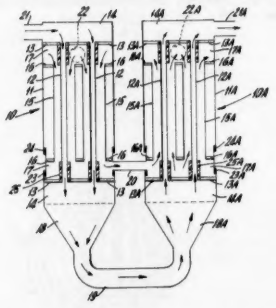


1. Method for stabilizing the temperature of a timepiece to permit it to operate within its normal working temperature range which comprises introducing the timepiece into a container having therein a body of a temperature stabilizing medium which exhibits at least one heat transformation point, whereby the latent heat of transformation absorbed or emitted by said medium at the time of passage through its transformation point produces a rise or fall in the temperature of said timepiece thereby stabilizing it.

3,863,708
MODULATABLE HEAT EXCHANGER WITH RESTRAINT TO AVOID CONDENSATION

George R. Grimes, deceased, late of Burgettstown, Pa. (by Mary E. Grimes; executrix), assignor to Amax Inc., New York, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,121
Int. Cl. B60h *1/00*
U.S. Cl. 165—1 **9 Claims**



1. A modulatable heat exchanger system for cooling hot dust-laden flue gas having an elevated dew point which comprises,
a heat exchanger unit formed of a bank of tubes coupled to tube manifolds such that the bank of tubes communicates with a hot gas inlet and a hot gas outlet coupled respectively to said manifolds,
each of said tubes being surrounded by a tube to provide annular spaces having manifolds communicating therewith through which air is circulated in said heat exchanger in concurrent flow with said hot flue gas,
means for maintaining a flow of hot flue gas through said heat exchanger to a downstream line,

a closed circuit air line including a blower for maintaining a flow of air through said heat exchanger in concurrent flow and heat exchanging relationship with said hot flue gas,

first valve means for feeding fresh air into said air line when needed,

first temperature-sensing means for sensing the temperature of the flue gas downstream of said heat exchanger,

second valve means in said air line operable in accordance with the temperature sensed by said first temperature sensing means for controlling the rate of flow of said air through said heat exchanger according to the temperature sensed by said first temperatures-sensing means,

second temperature-sensing means associated with a portion of the heat exchanger in contact with said flue gas for sensing the temperature of the heat exchanger at said portion,

said second temperature-sensing means being operably coupled to said first valve means for controlling the feeding of fresh air to said air line,

and a pressure-sensing device in said air line coupled to a third valve means comprising an exit air gas valve for opening said valve to expel air from said line when a pressure above a predetermined pressure is sensed in the air line,

whereby the flow of air through the heat exchanger is independently controlled relative to the flow of said flue gas so as to maintain the temperature of said heat exchanger above the dew point of said hot flue gas during the cooling thereof in accordance with the temperature sensed by the temperature-sensing means of the system.

3,863,709

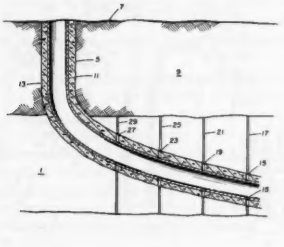
METHOD OF RECOVERING GEOTHERMAL ENERGY

John L. Fitch, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 20, 1973, Ser. No. 426,851

Int. Cl. F24j *3/02;* **F28d** *21/00*

U.S. Cl. 165—1 **9 Claims**



1. A method of recovering geothermal energy from a low permeability subterranean geothermal formation having a preferred vertical fracture orientation, comprising the steps of:

a. providing a first and a second well which extend from the surface of the earth and penetrate said geothermal formation at an angle of at least 10° measured from the vertical and extend into the formation in a direction transversely of said preferred vertical fracture orientation;

b. hydraulically fracturing said formation to provide a plurality of vertical fractures which are spaced laterally one from the other a predetermined distance measured in a direction approximately normal to the preferred vertical fracture orientation and which fractures extend into the formation and intersect said first and said second wells;

c. providing fluid communication intermediate each of said plurality of vertical fractures with each of said first and said second wells;

d. injecting a fluid via one of said first and said second wells into said plurality of vertical fractures;

e. flowing said fluid through said plurality of vertical fractures to heat said fluid; and

f. producing said heated fluid from said plurality of vertical fractures via the other of said first and said second wells.

3,863,710

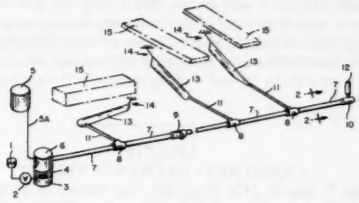
HEAT EXCHANGE SYSTEM

Richard M. Masters, 1 Burns Rd., Lexington, Mass. 02173

Filed Dec. 11, 1972, Ser. No. 313,934

Int. Cl. F28f *7/00*

U.S. Cl. 165—46 **25 Claims**



1. A heat exchange system comprising

a heat source for heating a fluid material;

a plurality of independently operable heat exchange devices, each of said devices being formed as a substantially flexible container capable of dissipating heat;

means for conveying said heated fluid material to each of said heat exchange devices in thermal relationship therewith so that heat contained in said heated fluid material is transferred to said heat exchange devices; and

means for mounting said heat exchange devices so that each of said flexible containers slopes in a substantially uniform direction from said conveying means independently of the pressure of the heated fluid material in the system and the heat from said heated fluid material is effectively transferred via said heat exchange devices to the regions adjacent thereto.

3,863,711

METHOD AND APPARATUS FOR MAINTAINING SUBSTANTIAL UNIFORMITY IN THE TEMPERATURE OF A HEAT-EXCHANGING FLUID

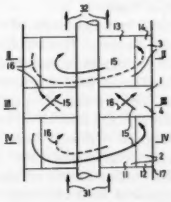
Georg Beckmann; Paul Viktor Gilli, both of Vienna, and Josef Lippitsch, Graz, all of Austria, assignors to Waagner-Biro Aktiengesellschaft, Vienna, Austria

Filed Feb. 8, 1973, Ser. No. 330,623

Claims priority, application Austria, Feb. 9, 1972, A 1027/72

Int. Cl. F28f *9/22*

U.S. Cl. 165—145 **12 Claims**



1. In a heat exchanger, first and second groups of tubes communicating with each other for directing an inner heat-exchanging fluid along the interior of said groups, said first

and second groups of tubes having a predetermined relationship with respect to an axis of the heat exchanger, means for directing an outer heat-exchanging fluid first across the exterior of said first group of tubes and then across the exterior of said second group of tubes to form from said outer fluid an entering stream distributed across said first group of tubes and an exiting stream distributed across said second group of tubes, said entering stream being composed of first and second stream portions which respectively have first and second relationships with respect to said axis and second exiting stream also being composed of first and second stream portions which have also said first and second relationships, respectively, with respect to said axis, and baffle means situated between said groups of tubes for deflecting said first stream portion of said entering stream to a location where said first stream portion of said entering stream forms said second stream portion of said exiting stream and for deflecting said second stream portion of said entering stream to a location where said second stream portion of said entering stream forms said first stream portion of said exiting stream, so that the temperature of said exiting stream will be substantially uniform.

3,863,712

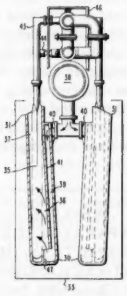
LIQUID HEAT EXCHANGE SYSTEM

Frank T. Smith, 2521 Bona Rd., and Robert D. Smith, 2407 Kingman Dr., both of Wilmington, Del. 19803

Continuation-in-part of Ser. No. 63,851, Aug. 14, 1970, abandoned. This application Aug. 19, 1971, Ser. No. 173,108

Int. Cl. F28c *7/06*

U.S. Cl. 165—145 **14 Claims**



1. An apparatus for accomplishing heat exchange between a flowing first liquid and a second liquid having a temperature significantly different from that of the first liquid which comprises

a. an elongated tank having an input means for receiving the flowing first liquid and an output means by which the flowing first liquid exits,

b. a plurality of tube bundles each of which comprises a plurality of small diameter flexible tubes made from an organic polymer composition, one end of each of which bundles is coupled to an inlet means while the other end is coupled to an outlet means to permit the flow of the second liquid through the interior of the tubes, each tube bundle being disposed within and extending substantially from the top to the bottom of the tank and in relationship to the input and output means of the tank such that a substantially unbroken heat exchange region is provided and the tank is divided into an input side and an output side,

c. means for directing the passage of a substantially uniform volume of the first liquid substantially radially through each unit area of the tube bundles.

3,863,713

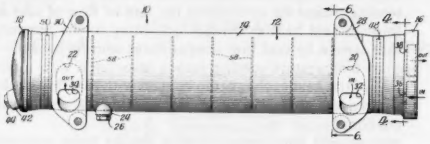
HEAT EXCHANGER

Vernon N. Tramontini, Indianapolis, Ind., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Aug. 27, 1973, Ser. No. 391,540

Int. Cl. F28b *9/14*

U.S. Cl. 165—158 **3 Claims**



1. A heat exchanger assembly, comprising: a generally tubular housing, a flat header plate adjacent each end of the housing having an original exterior dimension less than the original interior dimension on said housing, a plurality of heat exchange tubes supported in said header plates, said housing having a peripherally compressed portion radially of at least one of said header plates for firmly holding said one header plate in position, said one header plate having a peripherally compressed portion firmly engaged with said peripherally compressed portion of the one header plate.

3,863,714

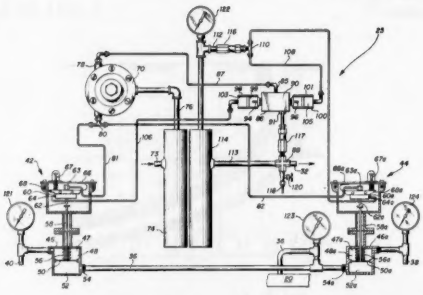
AUTOMATIC GAS WELL FLOW CONTROL

David Reed Watson, Jr., Midland, Tex., assignor to Compatible Controls Systems, Inc., Midland, Tex.

Filed Apr. 17, 1973, Ser. No. 352,043

Int. Cl. E21b *43/00*

U.S. Cl. 166—53 **13 Claims**



1. A control apparatus for a petroleum well having a tubing string and discharge line discharging into a sales line comprising:

a control valve interposed between said tubing string and sales line adapted to open or shut-in said well;

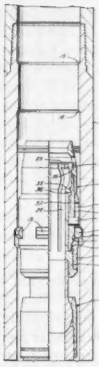
flow sensing means for monitoring the petroleum flow from said well and adapted to close said valve to shut-in said well when the flow decreases below a predetermined rate; and

pressure monitoring means for measuring the pressure differential between the tubing string and sales line and adapted to open said valve permitting delivery of petroleum from said well only when a predetermined differential therebetween exists whereby said well remains shut-in until the differential pressure builds to a level for acceptable volumetric flow from the well.

3,863,715
LANDING AND RUNNING TOOL ASSEMBLY

John H. Yonker, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Oct. 10, 1973, Ser. No. 405,084
Int. Cl. E21b *23/00*
U.S. Cl. 166—217 7 Claims



1. An anchoring tool comprising,

an elongate body,

external lug means carried by the body and adapted to be extended into a latching groove in a mandrel,

internal lug means carried by the body adapted to be extended above a shoulder on a running tool,

said body holding said internal lug means against movement along said elongate body relative to said external lug means while permitting said internal lug means to move laterally of the elongate body,

expander means having external land means and groove means cooperable with the external lug means and internal land means and groove means cooperable with the internal lug means,

said expander means movable between a running position in which the external groove means cooperates with the external lug means permitting them to retract and the internal land means cooperates with and extends the internal lug means and an anchoring position in which the external land means cooperates with and extends the external lug means and the internal groove means cooperates with and permits the internal lug means to retract.

3,863,716
CEMENTING PLUG RELEASE ASSIST APPARATUS

Steven G. Streich, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Apr. 5, 1974, Ser. No. 458,197
Int. Cl. E21b *33/05*
U.S. Cl. 166—70 8 Claims

1. Apparatus for assisting in the release of a cementing plug within a cementing plug container of the type which includes a closed tubular body having an upper end portion, a lower end portion for communication with the upper end of a casing string, a substantially cylindrical cavity formed in the body communicating with the lower end portion, a fluid inlet formed in the body intermediate the upper and lower end portions and communicating with the cavity, a plug retaining and releasing pin alternately insertable into the cavity and removable therefrom to support the cementing plug in the cavity above the fluid inlet, and, alternately, release the cementing plug, comprising:

a body member having an upper end portion and lower end portion and a longitudinal passageway extending therethrough and intersecting the upper and lower end portions thereof;

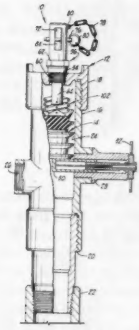
means formed on said body member for securing said body member in the upper end portion of the cementing plug container with the longitudinal passageway of said body member communicating with the cylindrical cavity in the plug container in substantial alignment therewith;

rod member means, having upper and lower end portions, movably disposed within the passageway of said body member for longitudinal movement between a lower position and an upper position in said body member;

seal means carried by said body member for providing a seal between said body member and said rod member means;

biasing means interposed between said body member and said rod member means for urging said rod member means upwardly relative to said body member;

extendable linkage means, having an upper end, a lower end and a medial portion intermediate the upper and lower



ends, with the upper end thereof secured to the lower end portion of said rod member means and the medial portion secured to the lower end portion of said body member, for extending the lower end of said linkage means downwardly relative to said body member in response to upward movement of said rod member means relative to said body member;

plug contacting means on the lower end of said extendable linkage means for contacting the cementing plug in the cementing plug container and moving the cementing plug downwardly within the cylindrical cavity of the cementing plug container in response to the extending of the lower end of said linkage means downwardly; and

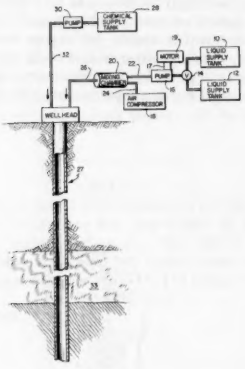
rod retaining and releasing means mutually engageable between said body member and said rod member means for retaining said rod member means in the lower position in said tubular body member against the urging of said biasing means and, alternately, releasing said rod member means for upward movement in said body member to the upper position in said body member.

3,863,717

METHODS FOR FORCING A LIQUID INTO A LOW PRESSURE FORMATION

Robert Ernest Cooper, London, England, assignor to Compagnie Des Services Dowell Schlumberger, Paris, France

Filed Jan. 29, 1974, Ser. No. 437,651
Claims priority, application France, Jan. 16, 1973, 73.01379
Int. Cl. E21b *43/25*
U.S. Cl. 166—279 6 Claims



1. In a process for treating wells extending from the surface of the earth to a reservoir formation from which oil having a gas in solution therein is produced, the steps of:

injecting into the well a sufficient volume of a liquid chemical agent adapted to stimulate said reservoir formation;

injecting a sufficient column of stable foam into the well under sufficient pressure to drive the column of liquids then present into the well back into the reservoir formation;

terminating pressure injection of said foam into said well when at least a substantial portion of said column of liquids has been forced back into said formation;

closing said well at the surface for a desired period of time; and

opening the well and allowing said foam column and eventually the remaining portion of said column of liquids to rise normally under the influence of formation pressure, thereby ejecting said foam as a column formed by a mixture of liquid chemical agent and of oil and gas in solution rises within said well.

3,863,718

CEMENTING PROCEDURE FOR AVOIDING MUD CHANNELING

Edmond H. Bruist, New Orleans, La., assignor to Shell Oil Company, Houston, Tex.

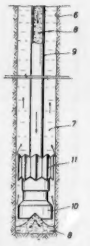
Filed Mar. 27, 1974, Ser. No. 455,171
Int. Cl. E21b *33/14, 33/16*
U.S. Cl. 166—285 9 Claims

1. A process for installing a pipe section that is to be cemented within a drilling-fluid-containing portion of a borehole of a well, which process comprises;

extending a relatively slender pipe string having an outer diameter significantly less than the borehole diameter into the borehole until it extends to at least near the bottom of the portion of the borehole in which the pipe section is to be cemented;

flowing fluid through the relatively slender pipe string to displace substantially all of the drilling fluid out of that portion of the borehole;

filling that portion of the borehole substantially completely with a subsequently solidifiable fluid that has a density at least substantially equalling that of the displaced drilling fluid and has a chemical composition that adapts it to remain pumpable, while remaining at the borehole temperature until the pipe section has been installed and a cement slurry has been inflowed, and then become substantially solid and impermeable;



removing the relatively slender pipe string and installing the pipe section to be cemented, and

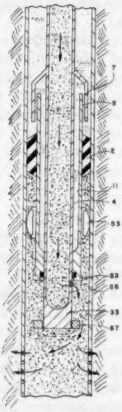
flowing a cement slurry into the annular space around the pipe section and allowing the solidification of both the cement and any subsequently solidifiable fluid that is present in that annular space.

3,863,719

RETRIEVABLE WELL PACKER WITH REVERSING FEATURE AND METHOD OF USE THEREOF

Charles Weber Parker, Odessa, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 23, 1973, Ser. No. 408,783
Int. Cl. E21b *33/129, 33/13, 43/25*
U.S. Cl. 166—305 R 16 Claims



1. Packer and valve apparatus having reverse-out features, said apparatus comprising: resilient packer means;

internal elongated tubular mandrel means having an unrestricted bore passage therethrough;

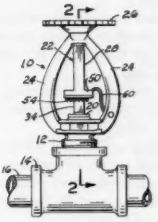
tubular elongated packer mandrel means containing said resilient packer means and telescopically mounted on said internal mandrel means;

anchor means on said packer mandrel means;
packer actuation means on said apparatus adapted to actuate said resilient packer means and said anchor means into contact with the wellbore;
friction means on said packer mandrel means to provide frictional engagement of said packer and valve apparatus in a wellbore;
passage means located between said internal mandrel means and said packer mandrel means;
valve means between said packer mandrel means and said bore passage of said internal mandrel means, said valve means arranged to provide in a first position of said valve means communication through said bore passage in said internal mandrel means to the annulus below said resilient packer means and in a second position of said valve means, communication from said internal mandrel means bore passage through said passage means to the annulus above said resilient packer means; and
valve actuation means on said apparatus adapted to actuate said valve means.

14. A method of injecting liquids and semi-liquids under pressure into an underground formation penetrated by a borehole, said method comprising:
lowering into said borehole a string of conduit containing annulus sealing means, friction engaging means, a plurality of passage means, and valve means adapted to communicate alternately with one or more of said passage means;
positioning said conduit in said borehole so that said annulus sealing means is located above said formation to be treated and said valve means is in a first position;
expanding said annulus sealing means against the borehole wall to isolate the annulus area therebelow between the conduit string and the borehole wall;
actuating said valve means to a second position thereby communicating said conduit string with the annulus above said expanded annulus sealing means;
injecting the desired liquids or semi-liquids into the conduit string in sufficient quantity to just fill the conduit string, while maintaining said valve means open between said conduit string and the annulus above said annulus sealing means;
actuating said valve to said first position thereby communicating said conduit string with the formation below said annulus sealing means;
injecting an additional amount of liquid or semiliquid material in the amount desired into said conduit string under pressure, into the annulus below said sealing means and into said formation;
actuating said valve means to said second position to close communication between said conduit string and said annulus below said sealing means while maintaining said sealing means engaged against the borehole wall and without releasing pressure on said formation, said second position arranged to communicate said conduit string with the annulus above said sealing means; and
injecting a displacement fluid into the annulus at the surface under pressure in sufficient quantities to flow down said annulus, through said passage means, said valve means, and up through said conduit means therby displacing the liquids in said conduit string.

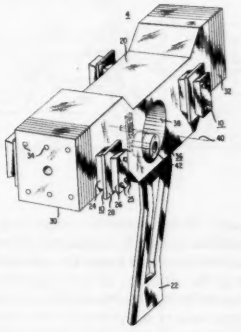
3,863,720
ELECTRICAL RESISTANCE FUSIBLE LINK FOR A SPRINKLER HEAD
Richard J. Young, 2131 S.W. 42, Oklahoma City, Okla. 73119
Filed Mar. 13, 1974, Ser. No. 450,951
Int. Cl. A62c *37/18*
U.S. Cl. 169—59 **4 Claims**

1. An electrically actuated release for an individual sprinkler head having a body including a cap normally closing an orifice axially aligned with a water deflector and having lever means interposed between the cap and water deflector with at least one portion of the lever means being separable from another portion to release the cap, the improvement comprising:



lever connecting means including an electrically fusible strand normally preventing separating movement between said lever means; and,
an electrical circuit including a normally open switch connecting a source of electrical energy to ground through said strand.

3,863,721
INERTIAL ORBITAL VIBRATING PLOW APPARATUS
Louis Joseph Scerbo, Randolph Twp., Morris County, and William Wallace Wood, Jr., Denville, both of N.J., assignors to Bell Telephone Laboratories, Inc., Murray Hill, N.J.
Filed July 16, 1973, Ser. No. 379,583
Int. Cl. E02f *5/02*
U.S. Cl. 172—40 **2 Claims**



1. An inertial orbital vibrating plow apparatus for forming a trench in the soil comprising in combination:
a mounting frame for receiving a force to move said apparatus along a preselected direction of travel;
a large inertia structural member having a center of rotation;
a plowshare rigidly mounted to and depending from said member to contact said soil, said member and said plowshare having a combined mass center which is located to the rear of said rotation center with respect to said direction of travel;
suspension means for mounting said structural member within said frame in such a manner that said force is transmitted from said frame to said member while said frame is substantially isolated from motions of said member, said suspension means including:
a torsion bar inserted through and having respective ends extending from said structural member, said bar being located to the rear of said rotation center with respect to said direction of travel and oriented substantially perpendicular to said direction;

mounting blocks rigidly mounted on said respective ends, said blocks including shafts extending therefrom substantially in said direction of travel;

a housing surrounding said blocks and adapted for connection to said frame;

bearing means in said housing into which said shafts extend, said bearing means allowing free movement of said shafts in said direction of travel and preventing movements in other directions; and

resilient mounting means for mounting said blocks to said housing to permit relative movement therebetween in said direction of travel; and

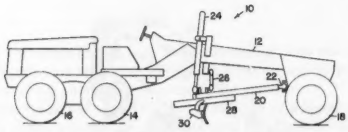
means for generating an orbital vibrating motion of said member about said center of rotation whereby said plowshare has an elliptical vibratory path with said path having a major axis inclined upwardly and forwardly with respect to said direction of travel.

3,863,722

MOTOR GRADER BLADE-SHIFTING HYDRAULIC ACTUATOR AND MOUNT THEREFOR

Paul Edmund Hanser, Moline, Ill., and Thomas Edward Gebauer, Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 26, 1973, Ser. No. 427,467
Int. Cl. E02f *3/12*
U.S. Cl. 172—795 **5 Claims**



1. A motor grader blade assembly comprising: a support frame; an elongate blade having front and rear sides; mounting means securing said blade to said frame for substantially linear guided movement in the direction of the length of said blade; a linear actuator means being fixed to said frame adjacent said blade and including a unitary reciprocable rod means oriented for movement lengthwise of said blade and having opposite concurrently shiftable ends; connection means securing the opposite ends of said rod means to said blade and acting so as to maintain said rod means in tension during reciprocating movement and during times when an end portion of the blade is deflected rearwardly within predetermined limits.

3,863,723

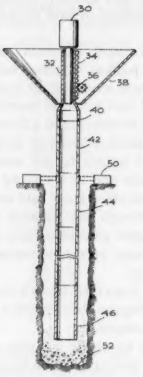
HOLE DRILL AND DEBRIS CLEARANCE METHOD AND MEANS

Charles S. Godfrey, Berkeley, Calif., assignor to Physics International Company, San Leandro, Calif.

Filed Jan. 23, 1974, Ser. No. 435,632
Int. Cl. E21b *19/00;* **E21b** *7/00*
U.S. Cl. 175—4.5 **7 Claims**

1. In a system wherein a hole is excavated using a cannon which fires a frangible projectile by means of propellant gases into said hole, the method of removing debris from the bottom of said hole, comprising

emitting gases including propellant gases from said cannon near to the bottom of said hole whereby said gases carry the debris upward out of said hole through the annular space between the walls of said hole and the barrel of said cannon.

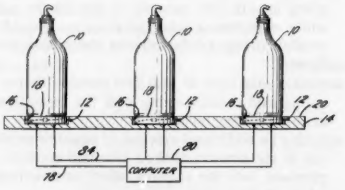


3,863,724

INVENTORY CONTROL SYSTEM

Nichola Dalia, Jr., 803 Smith St., Linden, N.J. 07036

Filed Sept. 20, 1973, Ser. No. 398,964
Int. Cl. G01g *3/14*
U.S. Cl. 177—25 **12 Claims**



1. Apparatus for determining the amount of material dispensed from a container during at least first and second points in time, comprising, in combination:

container support means for supporting at least one container of material to be dispensed, said container support means comprising a housing including a container support surface which is at least partially flexible and is responsive to the weight of said container and the material therein, so that movement of said container support surface produced by said container and the material therein resting on said container support surface corresponds to the weight of said container and the material therein,

transducer means mounted within said housing and responsive to movement of said container support surface for converting movement of said container support surface into a corresponding electrical signal, said electrical signal corresponding to the weight of said container and the material therein,

and conversion means responsive to said transducer means for sampling the signals provided thereby at first and second points in time and converting said electrical signals into a useful format relating to the weight of material in said container during said first and second points in time and operating on said converted signals to determine

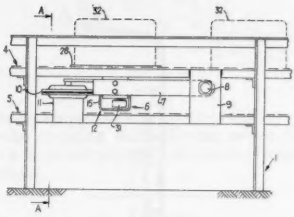
the amount of material dispensed from said container between said first and second points in time.

3,863,725

CONVEYOR WEIGHING SCALE

Stephen Henry Raynes, Aylesbury, England, assignor to Arthur Guinness Son and Company (Park Royal) Limited, London, England

Filed June 1, 1973, Ser. No. 366,112
Int. Cl. G01g *13/00*
U.S. Cl. 177—52 **5 Claims**



1. A weigh assembly for a conveyor which comprises a weigh device comprising at least two substantially parallel diaphragms secured in overlying and vertically spaced relationship by rigid tubular support means, the diaphragms being substantially rigid in the planes of their extent and having a degree of flexibility in the direction normal to such planes; rigid coupling means located within the confines of said tubular support means, said coupling means extending axially between and being secured to the diaphragms at positions remote from the support means and substantially centrally thereof; a substantially horizontal platform rigidly secured relative to one of said means and in substantially vertical alignment with that said means, said platform being intended to receive an article to be weighed, said article being locatable in any position over the surface of said platform; a measuring device responsive to relative vertical displacement of, or relative vertical loading on, the one said means relative to the other said means as a result of an article being supported on the platform from which displacement or loading the weight of the article may be determined; and wherein said diaphragms each have an array of radially extending reinforcing means thereon which are circumferentially spaced relative to the axis of the coupling means and provide localized stiffness in the diaphragms radially relative to said axis, each said reinforcing means having an elongated configuration and being located on its respective diaphragm with the larger dimension lying radially relative to said axis over the portion of the diaphragm between said support means and said connecting means,

said device being carried by a lift frame which is intended to be mounted with the platform underlying the conveyor, and wherein lift means is provided to raise and lower the lift frame so that the platform of the weigh device when raised can receive thereon articles from the conveyor for weighing purposes.

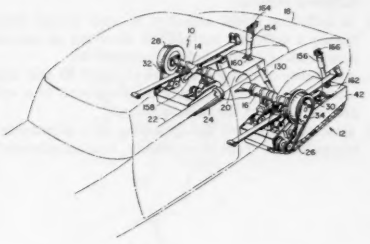
3,863,726

TRACKED DRIVE FOR VEHICLES

Roy E. O'Brien, 17834 Millar Rd., Mt. Clemens, Mich. 48043; Donald J. Leslie, 1310 N. Washington, Apt. No. 11, Royal Oak, Mich. 48067, and Michael R. Leslie, 1947 Robina Ave., Berkley, Mich. 48072

Filed Apr. 23, 1973, Ser. No. 353,599
Int. Cl. B62d *55/04*
U.S. Cl. 180—5 A **9 Claims**

1. A tracked drive for vehicles having a driven axle having a leaf spring structure connected thereto comprising an endless ground-engaging track, a housing operatively mounting said track, first sprocket means journaled in said housing operatively engaging the track for driving same, second sprocket means connectible to the axle to be driven thereby, means drivingly connecting said first and second sprocket



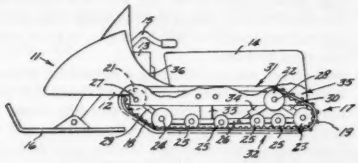
means, and means for connecting the tracked drive to a vehicle, said means for connecting the tracked drive to a vehicle including additional leaf spring means connected to the housing, and structure for connecting said additional leaf spring means to the vehicle leaf spring means and vehicle driven axle.

3,863,727

SUSPENSION SYSTEM FOR TRACKED VEHICLES

Regis C. Michrina, Lansing, Mich., assignor to Allied Leisure, Inc., Lansing, Mich.

Filed May 10, 1973, Ser. No. 358,884
Int. Cl. B62m *27/00*; **B62d** *55/00*
U.S. Cl. 180—5 R **7 Claims**



1. A suspension system for tracked vehicles comprising:

two parallel spaced apart axles, at least one of said axles being driven;

a lower frame element in spaced relation beneath said two axles;

a pair of frame extenders, one depending from each of said fixed axles and supporting said lower frame, said extenders being equal in length and parallel to each other when connected to the fixed axles and said lower frame;

an endless drive track supported internally on said fixed axles and said lower frame and driven by the driven one of said axles; and

a variable compression spring means acting against the lower frame and said fixed axles whereby said lower frame is controllably depressible and extendable toward and away from said fixed axles in the manner of a parallelogram.

3,863,728

VEHICLE INSECT PROTECTION APPARATUS

Theodor H. Mittendorf, Rte. 1, Box 102, Tavares, Fla. 32778

Filed Nov. 9, 1973, Ser. No. 414,204
Int. Cl. B60k *11/02*
U.S. Cl. 180—68 P **5 Claims**

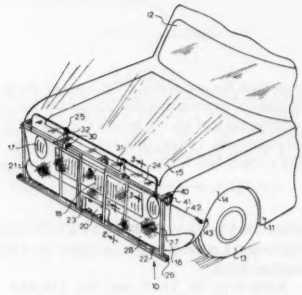
1. An insect protection apparatus for moving vehicles comprising in combination:

a. an adjustable screen means removably attachable to the front of a vehicle for preventing insects from passing therethrough onto the front end of said vehicle, said screen means having a plurality of panels, each panel having a frame and being adjustable relative to each other panel whereby said screen means can be adjusted for different vehicles;

b. a deflector shield attached to said screen means and having a deflector surface for directing air currents and insects away from a vehicle windshield;

c. a plurality of brace members attached to said adjustable screen means for engaging the front end of a vehicle to provide support for said apparatus;

d. attachment means for attaching said adjustable screen means to the front of a vehicle, said attachment means



including means for attaching one portion of said adjustable screen means to the tire well of a vehicle with flexible members and means for attaching a second portion of said screen means to the front of a vehicle with at least one rigid bracket;

e. said screen means including a horizontal grooved frame member for the bottom portion of the screen panel to fit into and a pair of vertically extending frame members attached to at least one panel member, said vertically extending frame members having said deflector shield attached thereto; and

f. the top portion of said panels being held together by the overlapping portion of said panels and an overlapping portion of said deflector shield and said vertically extending frame members having a portion extending over the top of said screen panels.

3,863,729

ENGINE COMPARTMENT SIDE SHIELD STRUCTURE

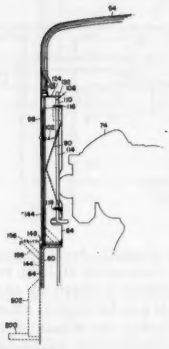
Cy William Von Fummetti, and David Dennis Latham, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 19, 1974, Ser. No. 462,587

Int. Cl. B62d *25/10*

U.S. Cl. 180—69 R **3 Claims**

1. In an industrial vehicle of a type including a longitudinal frame supported on rotatable ground-engaging means, an engine mounted on the frame and located in an engine compartment bounded at top and upper side portions by a hood, at bottom and lower side portions by said frame and at opposite intermediate side portions by a pair of side shield structures extending between said frame and said hood, the improvement comprising: at least one of the side shield structures including a longitudinal upright door support means fixed to said frame and extending upwardly alongside said engine between the frame and hood; said support means including a baffle plate having upper and lower horizontal longitudinally extending edges respectively spaced below and above said hood and frame and inwardly from a bend line located substantially halfway between and extending parallel to said upper and lower edges; a first longitudinal door normally located in a closed position wherein it is vertically disposed beside and outwardly of a lower portion of said baffle plate and cooperate therewith to form a downwardly and inwardly directed passage leading to the engine compartment, said first door being pivotally mounted, adjacent to lower edge thereof, to said door support means for vertical swinging movement about a first horizontal, longitudinal axis from said closed position to an open position; a second longitudinal door normally located in a closed position wherein it is vertically disposed beside and outwardly of an upper portion of said



baffle plate including said upper edge and cooperates therewith to define an upwardly and inwardly directed passage leading to the engine compartment; and said second door being pivotally mounted, adjacent a lower edge thereof, to said door support means for vertical swinging movement about a second horizontal, longitudinal axis from said closed position to an open position; latching means for releasably latching said first and second doors in their closed positions; and said first and second doors cooperating with said baffle plate to block manual access to the compartment when said doors are in their closed positions.

3,863,730

ANTI-SKID CONTROL DEVICE FOR VEHICLES WITH CLUTCH RELEASING

Hisato Wakamatsu; Noriyoshi Ando, and Kazu Majima, all of Kariya, Japan, assignors to Nippon Denso Company Limited, Kariya-shi, Aichi-ken, Japan

Continuation-in-part of Ser. No. 61,407, Aug. 5, 1970, abandoned, and a continuation of Ser. Nos. 808,596, March 19, 1959, abandoned, and Ser. No. 829,901, June 3, 1969, Pat. No. 3,653,726. This application Feb. 26, 1971, Ser. No. 119,311

Claims priority, application Japan, Apr. 22, 1968, 43-26923; June 3, 1968, 43-37904; June 6, 1968, 43-38879; Oct. 31, 1968, 43-79445; Jan. 11, 1969, 44-2177

Int. Cl. B60t *8/08*

U.S. Cl. 180—82 R **32 Claims**

1. An anti-skid control arrangement for vehicles having a wheel braking system and a cooperating braking force releasing means and a motor-wheel clutch comprising;

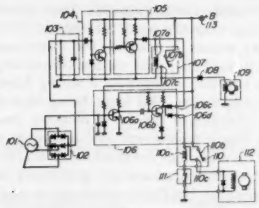
clutch releasing means,

means for automatically energizing said braking force releasing means upon sensing wheel angular deceleration exceeding a predetermined value to effect automatic releasing of said braking force at least until said deceleration decreases to said predetermined value,

means operative at least upon the condition that said energizing means is operative, for automatically actuating said

clutch releasing means to effect automatic releasing of said clutch, and

means operable by said energizing means and upon sensing substantially zero wheel speed for maintaining said energizing means operative as aforesaid and for at least conditionally operating said actuating means to cause said clutch to be released by said clutch releasing means as aforesaid.



3,863,731

INSTRUMENT PANEL SUPPORTING CONSTRUCTION OF VEHICLES

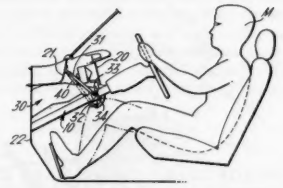
Ichiro Suzuki, Toyota, and Fumio Sugiura, Nisshin-cho, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki kaisha, Aichi-ken, Japan

Filed Aug. 23, 1973, Ser. No. 390,787

Claims priority, application Japan, Apr. 19, 1973, 48-44324

Int. Cl. B60k *37/00*

U.S. Cl. 180—90 **5 Claims**



1. In an instrument panel supporting construction for a vehicle comprising first supporting means for hanging a portion of an instrument panel onto a cowl panel of the vehicle body, and second supporting means for supporting a steering column assembly of the vehicle on the vehicle body,

the improvement wherein said first supporting means comprises a pair of struts for independently hanging the bottom portions of said instrument panel separated at the left and right sides of said steering column assembly from said cowl panel and said second supporting means comprises a first and a second supporting members for supporting said steering column assembly from said cowl panel and a dash panel of the vehicle body.

3,863,732

FLEXIBLE SKIRT ASSEMBLIES FOR FLUID CUSHION SUPPORTED VEHICLES

Peter Rowland Crewe, Newport, Isle of Wight, England, assignor to British Hovercraft Corporation Limited, Westland Works, Yeouil, Somerset, England

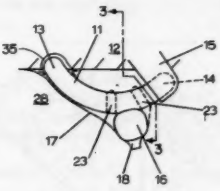
Filed Jan. 9, 1973, Ser. No. 322,178

Claims priority, application Great Britain, Jan. 12, 1972, 1439/72

Int. Cl. B60v *1/16*

U.S. Cl. 180—124 **13 Claims**

1. In a vehicle which receives support from at least one pressurized fluid cushion, a flexible skirt assembly for forming part of the cushion sealing means of the vehicle, wherein the skirt assembly includes a horizontal inflatable flexible cylindrical member which in operation of the vehicle is supported below rigid structure of the vehicle by arcuate inflatable flexible tubular members, and a flexible impermeable sealing curtain which in operation has one edge attached to the underside of rigid structure of the vehicle and is supported against forces generated by fluid cushion pressure by the horizontal inflatable flexible cylindrical member and the arcuate inflatable flexible tubular members, said flexible skirt assembly being fitted beneath the vehicle across the aft end so that the arcuate members are substantially parallel to the longitudinal axis of the vehicle.



3,863,733

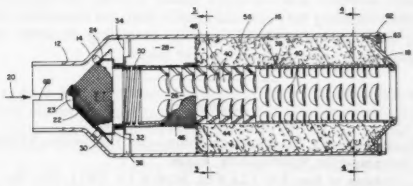
EXHAUST SILENCER FOR INTERNAL COMBUSTION ENGINE

Charles J. Raudman, Jr., Newhall, and Clyde W. Robertson, El Monte, both of Calif., assignors to Skyway Machine, Inc., San Fernando, Calif.

Continuation-in-part of Ser. No. 240,633, April 3, 1972, abandoned. This application Aug. 24, 1973, Ser. No. 391,225

Int. Cl. F01n *1/04*

U.S. Cl. 181—42 **8 Claims**



1. An exhaust silencer for receiving an exhaust stream from a combustion engine comprising:

a housing adapted to be connected to receive said exhaust stream;

an open ended core mounted in said housing with an open space formed between the outer wall of the core and the inner wall of the housing, said space including first and second portions, said second space portion having a substantially greater longitudinal extent than said first portion, said core having a plurality of inwardly extending louvers formed along the longitudinal extent of said core and circumferentially thereabout, the openings of all of said louvers facing towards the direction of flow of said exhaust stream, said louvers having curved surfaces tapered in the direction from which said exhaust stream flows; and

sound absorbing material substantially filling only said second space portion, thereby impeding the flow of gas through the louvers to said second portion;

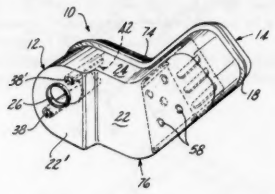
the curved tapered surfaces of said louvers operating to shape the sound waves so as to create a low pressure barrier which tends to attenuate the sound energy.

3,863,734

MUFFLER FOR INTERNAL COMBUSTION ENGINES

Julian S. Pawlina, Elkhart, Ind., assignor to Tecumseh Products Company, Tecumseh, Mich.

Continuation of Ser. No. 300,842, Oct. 25, 1972,. This application Jan. 14, 1974, Ser. No. 433,115
Int. Cl. F01n *1/08*
U.S. Cl. 181—49 **20 Claims**



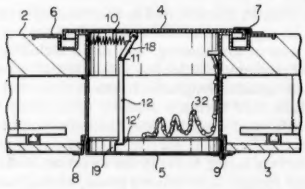
1. A muffler comprising, a closed chamber having an exhaust inlet adjacent one end, an exhaust outlet adjacent the other end, a first outer wall portion with said exhaust inlet therein and at least two spaced mounting holes extending therethrough adjacent said exhaust inlet adapted to receive bolts for mounting said muffler on an engine, and a second outer wall portion axially spaced from and generally opposed to said first outer wall portion with second mounting holes therethrough coaxial with said first-mentioned mounting holes, a one-piece baffle member having two spaced perforate panel portions integrally interconnected by a bight portion, said baffle member being fixed in said chamber between said inlet and outlet and oriented therein with said panel portions spaced apart in the direction of gas flow through said chamber to divide said chamber into at least three compartments through which exhaust gases pass, and a one-piece spacer member received in said chamber immediately adjacent said exhaust inlet such that at least a portion of the exhaust gases from the inlet pass therethrough before passing through said baffle member, said one-piece spacer member having spacer tubes extending between said coaxial first and second mounting holes and a perforate portion extending between and rigidly interconnecting said spacer tubes.

3,863,735

INDOOR ESCAPE DEVICE

Hiromitsu Naka, No. 39, Oaza Shinmachi, Yashio-cho, Minami Saitama-gun, Saitama-ken, Japan

Division of Ser. No. 124,034, March 15, 1971, Pat. No. 3,768,593. This application Aug. 15, 1973, Ser. No. 388,446
Int. Cl. E06c *1/56*
U.S. Cl. 182—81 **3 Claims**



1. An escape system to be positioned between the floor of one story of a building and the ceiling of a story below the first mentioned story, said system comprising:

an escape means including a first frame means adapted to be positioned at one end of a hole formed between a slab of the floor of said one story and the slab of the ceiling of said story below said first mentioned story, and a second frame means adapted to be positioned at the other end of said hole;

a cover member positioned over each of said frames for closing the hole when the system is not in use, each of said cover members being pivotally mounted to its respective frame means;

means operatively connecting said cover members to each other so that when the cover member positioned over said first frame means is opened, the other cover member opens automatically, said means connecting said cover members together comprising a spring biased lever and an abutment means, said lever being biased toward the opening direction of the cover member positioned over said first frame means and said abutment means being mounted on said other cover member, said lever engaging both said abutment means and said cover member positioned over said first frame means when said cover members are closed, whereby when said first mentioned cover member is opened, said lever moves away from said abutment means releasing said other cover member; and

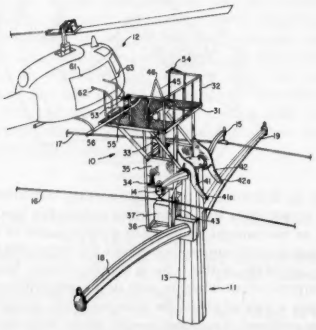
an escape unit secured within or adjacent said escape means and adapted to extend through at least part of said escape means when said cover members are open for use by the evacuee in passing through said escape means.

3,863,736

HELICOPTER-MOUNTABLE LANDING PLATFORM AND WORK SCAFFOLD AND METHOD OF PLACING SAME IN OPERATING POSITION

Roy J. McWilliams, Pomona, N.Y., assignor to Decair Helicopters, Inc., Spring Valley, N.Y.

Filed May 31, 1973, Ser. No. 365,713
Int. Cl. E04g *3/08*
U.S. Cl. 182—150 **11 Claims**



1. A landing platform and work scaffold adapted to be positioned on a pole structure by a helicopter or the like comprising:

a scaffold for supporting one or more persons;

means mounted on said scaffold enabling said scaffold to be suspended from a helicopter;

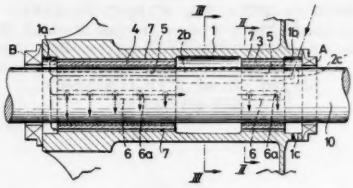
means mounted on said scaffold for engaging a pole structure to support said scaffold at the top of the pole structure when said scaffold is lowered onto the pole structure; and

a landing platform mounted on top of said scaffold in a position to provide clearance between the top of the pole structure and the rotor of a hovering helicopter touching said landing platform, said landing platform being of a size to permit one or more persons to step directly from the cabin of a hovering helicopter onto said landing platform when said scaffold is supported at the top of the pole structure.

3,863,737
LUBRICATING OIL SUPPLYING APPARATUS FOR STERN TUBE BEARING

Minoru Kakihara, Okayama, Japan, assignor to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Filed May 14, 1973, Ser. No. 359,667
Claims priority, application Japan, May 19, 1972, 47-50103
Int. Cl. F16c *17/10*
U.S. Cl. 308—122 **1 Claim**

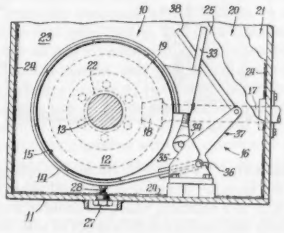


1. A lubricated stern tube bearing assembly, comprising: a bearing, a stern tube surrounding said bearing, a shaft extending through said stern tube and rotatably mounted in said bearing, sealing means associated with said shaft at opposite end of said stern tube for cooperating with said bearing and stern tube to define a fore lubricant reservoir at one end of said bearing and an aft lubricant reservoir at the other end of said bearing, passage means for flowing lubricant through said tube and along said bearing and to the aft reservoir from a location adjacent said fore reservoir, a plurality of peripherally-spaced lubricant grooves extending longitudinally in said assembly between said bearing and said tube for providing fluid communication between said reservoirs, said bearing having a plurality of apertures providing fluid communication between said lubricant grooves and said shaft, and means providing a lubricant outlet from said fore reservoir, whereby lubricant supplied to the aft reservoir returns through the grooves to the fore reservoir while lubricating and cooling the bearing.

3,863,738
COMBINED DRAINING AND BRAKE ADJUSTMENT MEANS FOR A BAND BRAKE ASSEMBLY

Gerald F. Molloy, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 1, 1974, Ser. No. 438,597
Int. Cl. F16d *51/04*
U.S. Cl. 188—77 R **7 Claims**

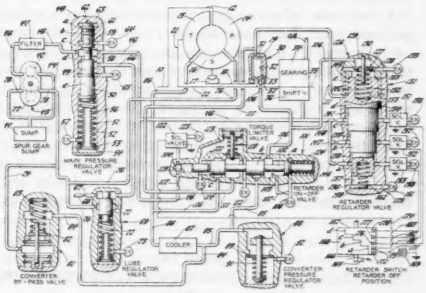


1. In a band brake assembly, at least partially enclosed by a housing, comprising a rotatable drum, a flexible band having a lining secured internally thereon to at least partially circumvent said drum for selective frictional engagement therewith and actuating means operatively connected to said band to selectively clamp and frictionally engage said lining with said drum, the invention comprising combined draining and brake adjustment means comprising a drain plug removably mounted exteriorly on a bottom wall of said housing and brake adjustment means comprising a screw threadably mounted on said drain plug to dispose an adjustement end thereof interiorly of said housing in close proximity to said band to insure uniform braking contact between said lining and said drum and releasable locking means for selectively locking said screw relative to said drain plug.

3,863,739
RETARDER CONTROL

Robert H. Schaefer, Westfield, and Carl A. Lentz, Mooresville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 23, 1973, Ser. No. 408,277
Int. Cl. F16d *57/02*
U.S. Cl. 188—296 **20 Claims**

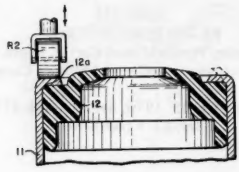


1. In a hydrodynamic retarder, a stator chamber having stator blades, an inlet connected to a radial inner portion and an outlet connected to a radial outer portion; a rotor rotatably mounted in said stator chamber and pumping fluid from said inlet to said outlet during rotor rotation; cooler means including an inlet and an outlet and providing a pressure drop therebetween; a sump; source means connected to said sump and said cooler means supplying fluid from said sump under pressure to said cooler means; a low pressure regulator valve connected to said cooler outlet to regulate cooler outlet pressure at a low value and exhaust excess fluid to said sump; retarder on off valve means operative in off position to connect said retarder outlet and retarder inlet to exhaust and in on position connecting said retarder outlet to said cooler inlet and said cooler outlet to said retarder inlet; retarder pressure regulator valve means connected to said retarder inlet and said retarder outlet and having biasing means including manual control means movable from a retarder off position to a full retarding demand position for increasing retarding demand and outlet pressure responsive control means connected to said retarder outlet; said biasing means operative in response to said manual control means increasing retarding demand to increase the force of said biasing means and to decrease the force of the biasing means as a function of retarder outlet pressure and said regulator valve means regulating said retarder inlet pressure at increasing pressure values as a function of increasing bias force to provide retarder torque increasing with retarding demand and increased with speed at a rate reduced with increasing speed.

3,863,740
SEAL FOR HYDRAULIC DAMPER

George Kinman, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed May 30, 1972, Ser. No. 257,520
Claims priority, application Great Britain, June 2, 1971, 18700/71
Int. Cl. F16f 5/00, 9/36
U.S. Cl. 188—322 3 Claims

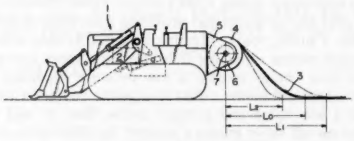


1. In a twin tube hydraulic damper including a cylindrical reservoir tube of permanently deformable metal the invention which comprises a rod seal housing adapted to receive a rod seal for sealing the piston rod of said damper, said housing being located in said tube and being of a cold deformable plastic material normally having an upper outer annular edge of approximately 90°, said tube having an end portion rolled over into direct engagement with said seal housing to deform said edge and maintain said edge deformed to form a liquid tight seal at said deformed edge between said tube and said housing without the interposition of a separate sealing gasket.

3,863,741
CONTROL SYSTEM FOR WINDING POWER SUPPLY CABLE

Yoshiji Mitsuishi, Midori-ku, Yokohama, and Toru Aihara, Sagamihara, both of Japan, assignors to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Apr. 15, 1974, Ser. No. 460,776
Claims priority, application Japan, Apr. 13, 1973, 48-43774
Int. Cl. H02g 11/00
U.S. Cl. 191—12.2 A 3 Claims

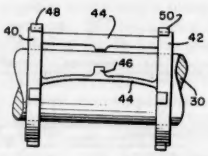


1. Control system for winding and unwinding a power supply cable for an electric-powered earthmoving or construction machine, comprising a reel assembly for winding the cable, a three-phase induction torque motor mechanically connected to drive said reel assembly, first contact means of connecting the torque motor to a three-phase AC electric source by a delta connection type, said contact means of connecting said torque motor to said three-phase AC electric source by a Y-connection type and a control circuit arranged to be actuated with changeover means for directional control of the machine, for alternately and selectively actuating the first and second contact means whereby said torque motor is connected to the electric source by the Y-connection type when the machine moves forward and by the delta connection type when it moves backward.

3,863,742
RETAINER FOR OVERRUNNING CLUTCH

J. Russell Elmore, New Hartford, and Gerard William Gehrke, Litchfield, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Aug. 8, 1973, Ser. No. 386,612
Int. Cl. F16d 15/00, 41/06
U.S. Cl. 192—45 19 Claims



1. A retainer for an overrunning clutch having an outer member and an inner member of less outside diameter than the inside diameter of the outer member with one of said members having a cam surface and rolling members in the space between the outer member and the inner member comprising:

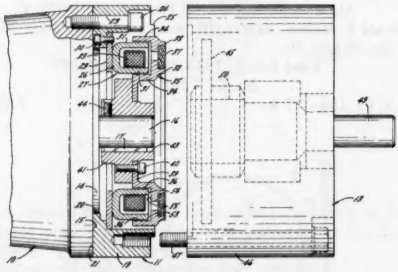
a pair of longitudinally spaced rims;

and at least one resilient spring bar member directly interconnecting the rims, said resilient spring bar member having a portion adapted to be engaged by a rolling member when the retainer and rolling members are assembled in the outer member with the inner member installed to flex said spring bar member circumferentially thereby causing a spring bias to be exerted against the rolling members and the spaced rims to move axially.

3,863,743
SUBASSEMBLY FOR MAGNETIC FRICTION COUPLING

Robert D. Rule, Rockford, Ill., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Oct. 5, 1973, Ser. No. 403,931
Int. Cl. F16d 27/10
U.S. Cl. 192—84 C 7 Claims



1. A subassembly for a magnetic friction coupling and comprising a frame member adapted to be fixed axially and radially with respect to a rotatable shaft, an annular magnet member fixed axially and radially with respect to said frame member, a rotor telescoped with and rotatable relative to said magnet member and adapted to be telescoped with and anchored to said shaft, there being a bearingless fit and radial clearance between all telescoped parts of said magnet member and said rotor so as to permit radial floating of said rotor relative to said magnet member prior to telescoping of said rotor with said shaft, and means coacting between said rotor and one of said axially and radially fixed members to locate said rotor axially relative to said magnet member without

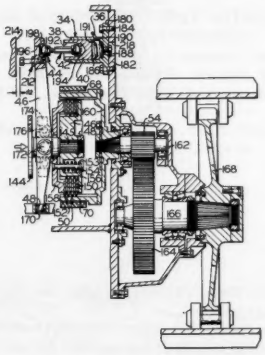
preventing said radial floating of said rotor relative to said magnet member, said means comprising a flange projecting radially from one of said rotor and said one axially and radially fixed member, and a groove extending circumferentially around and opening radially from the other of said rotor and said one axially and radially fixed member and receiving said flange with radial clearance.

3,863,744

STEERING CLUTCH ACTUATING SYSTEM

John W. Bridwell, Peoria; Conard E. Leighty, Metamora, and John G. Wellwood, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 1, 1972, Ser. No. 285,925
Int. Cl. F16d 25/08
U.S. Cl. 192—91 R 3 Claims



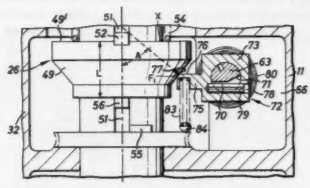
1. In a track-type vehicle having a steering clutch for selectively discontinuing power transmission to a track of said vehicle; yoke means associatd with said clutch for disengaging said clutch when disposed in a first predetermined position and for engaging said clutch when disposed in a second predetermined position, actuator means connected to an externally accessible portion of said vehicle for moving said yoke means toward said first predetermined posit'on, single rod means connected between said yoke means and said actuator means for transmitting actuator forces to said yoke means for movement thereof, said single rod means being connected between said actuator means and said yoke means by means of spherical joints movably mounted within sockets in said actuator means and in said yoke means, said actuator means including a fluid motor having a piston which receives a portion of said single rod means therein, said piston being mounted within a fluid-tight cylinder having a pressure chamber therein directly communicating with a portion of said piston and wherein a fluid bleed port is provided in said cylinder which communicates said pressure chamber with the exterior of said cylinder, said bleed port being accessible from the exterior of said vehicle, said actuator means including a flange member which is directly connected to said externally accessible portion of said vehicle by means of readily removable fastening means and wherein upon removal of said fastening means from said flange member said actuator means may be removed from said vehicle, said externally accessible portion of said vehicle including an access opening having a dimension greater than that of a portion of said fluid-tight cylinder, said flange member being attached to said fluid-tight cylinder externally of said access opening while said portion of said fluid-tight cylinder is disposed within said access opening, said fluid-tight cylinder being removable through said access opening upon removal of said fastening means.

3,863,745

CAM OPERATED CLUTCHES WITH AUTOMATIC LOCK

Jeremy Joseph Fry, Bath, England, assignor to Rotork Limited, Lower Weston, Bath, Somerset, England

Filed Mar. 9, 1973, Ser. No. 339,712
Claims priority, application Great Britain, Mar. 23, 1972, 13630/72
Int. Cl. F16d 11/04
U.S. Cl. 192—93 R 10 Claims



1. In a drive mechanism which has an output shaft, power means for rotating the output shaft, and means for manually rotating the output shaft, an annular clutch member non-rotatably mounted on the output shaft and having bearing surfaces slideable axially thereon operably connecting the output shaft to said manually rotating means and said power means, a clutch ring on said clutch member, a clutch actuator associated with said clutch member and engaging said clutch ring, resilient means for urging the clutch member away from the manually rotating means, said actuator being rotatable about an axis which is perpendicular to the axis of the clutch member for moving said clutch member axially against said resilient means for operably connecting the output shaft to the manually means, one of the engaging surfaces of the clutch ring and actuator being shaped as a cam surface sloping towards the axis of said shaft whereby the force exerted on the clutch member against said resilient means by the actuator as it is rotated is applied at a constant angle relative to the center line of the clutch member and always intereacts the shaft within the length of said bearing surfaces so as to prevent jamming between the clutch member and the output shaft.

3,863,746

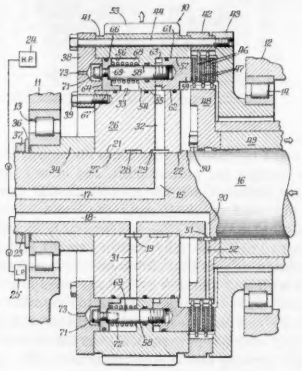
CENTRIFUGALLY BALANCED ROTATING CLUTCH

Gunter W. Schulz, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 30, 1973, Ser. No. 346,648
Int. Cl. F16d 25/063
U.S. Cl. 192—106 F 1 Claim

1. In a fluid operated rotary clutch having rotatable clutch discs and plates which are movable into frictional engagement for engaging said clutch and movable out of frictional engagement for disengaging said clutch and having fluid pressure responsive actuating means for selectively engaging and disengaging said clutch; balance means for negating the effect of centrifugally generated fluid pressure upon said actuating means, said actuating means including first separate actuator piston means movable in response to fluid pressure for causing said discs and plates to engage said clutch, said balance means including second separate balance piston means connected to and movable with said actuator piston means, said actuator piston means and said balance piston means being housed respectively within separate first and second axially spaced aligned chambers having substantially equal cross-sectional areas and being separated by an annular radial wall, said first and second aligned chambers being annular and the inner and outer radii of each of said first and second chambers being respectively equal, said actuating means further including a source of high pressure actuating fluid and communication means for selectively communicating said high-pressure fluid to said first chamber and for selectively venting said first chamber, said separate first and second aligned annular cham-

bers being separated by said annular radial wall, said wall being transpierced by at least one axial bore, and rod means slidably extending through said at least one axial bore and interconnecting said separate actuator piston means and said separate balance piston means for unitary axial movement thereof, said balance means further including spring means disposed between said annular radial wall and said balance piston means for urging said balance piston means axially away from said annular radial wall, said balance means further including a source of low-pressure fluid and further communication means for selectively communicating said low-pressure fluid to said second chamber and for venting fluid therefrom,



said fluid operated rotary clutch further including an annular output gear for providing clutch output torque, and said first and second aligned annular chambers being disposed concentrically within said annular output gear, said fluid operated rotary clutch receiving input torque from a first shaft and said further communication means including a second passageway formed within and extending axially along said first shaft, cooling means for supplying cooling fluid to said discs and plates, said cooling means including a radial passage in communication with said second passageway formed within said first shaft and receiving coolant fluid from said source of low-pressure fluid.

3,863,747

FRICTION DISC ASSEMBLY FOR A FRICTION COUPLING

Karl-Heinz Werner, and Karl-Heinz Dotter, both of Schweinfurt am Main, Germany, assignors to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Filed July 30, 1973, Ser. No. 383,614

Claims priority, application Germany, Aug. 3, 1972, 287286

Int. Cl. F16d *3/14, 47/02*

U.S. Cl. 192—106.2 **11 Claims**

1. A coupling disc assembly for a friction coupling comprising:

a. a hub unit including a tubular hub member having an axis, and a flange member projecting from said hub member in a radially outward direction;

b. a disc unit including a first radial disc member and a second radial disc member coaxially movable relative to said hub unit and offset from said flange member in opposite axial directions, and a plurality of spacer members fixedly connecting said disc members for joint movement;

c. first yieldably resilient means operatively interposed between said units for angularly biasing said disc unit toward an angular rest position relative to said hub unit;

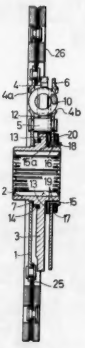
d. an annular damper element coaxially movable relative to said units;

e. second yieldably resilient means operatively interposed between said disc unit and said element for angularly biasing said element toward an angular rest position relative to said disc unit;

f. cooperating abutment means on said element and on said hub unit engageable for limiting angular displacement of said element relative to said hub unit;

g. first brake means for impeding angular movement of said element relative to said hub unit between said rest position of the element and a position of abutting engagement of said abutment means, said first brake means including

1. spring means operatively interposed between said flange member and one of said disc members for biasing said one disc member axially away from said flange mem-



ber and for thereby biasing the other disc member toward said flange member,

2. motion transmitting means operatively connecting said element to said other disc member for joint axial movement when said other disc member moves toward said flange member under the biasing force of said spring means, and

3. friction means axially interposed between said element and said flange member for simultaneous engagement with said element and said flange member;

h. second brake means interposed between said disc unit and said element for frictionally impeding angular movement of said element relative to said disc unit; and

i. friction facing on a radially outer circumferential portion of said first disc member.

3,863,748

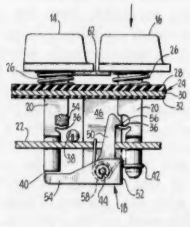
SHIFT LOCK MECHANISM

Richard Dale Trezise, Fremont, Calif., assignor to The Singer Company, New York, N.Y.

Filed Nov. 14, 1973, Ser. No. 415,887

Int. Cl. B41j *5/22*

U.S. Cl. 197—107 **4 Claims**



1. In combination with a manual keyboard with manual keys

depressible relative to a keyboard mounting plate, a shift lock key mechanism comprising:

a manually actuatable shift key positioned in the keyboard;

a manually actuatable lock key positioned adjacent to the shift key;

a stem on said shift key being substantially identical with a stem on the locking key;

means mounted between said keys and engageable by said shift key stem and said lock key stem so as to hold said shift key depressed when said lock key is depressed, said means comprising a bellcrank having a latch arm and a release arm, said release arm being engageable by said shift key and said latch arm being engageable by said lock key, said lock arm further being positioned to engage said lock key stem when the latter is depressed, and

means engaging said shift key so as to depress said shift key upon depression of said lock key.

3,863,749

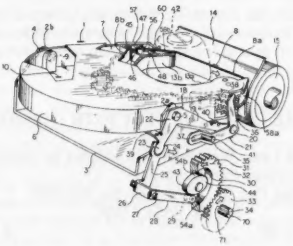
SPOOLLESS RIBBON CARTRIDGE WITH LIFT AND FEED FEATURES COMBINED

Donald S. Perry, Los Altos, Calif.; Wyland L. Fowler, Green; Richard E. Shattuck, and Hans W. Mueller, both of Cortland, all of N.Y., assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 259,766, June 5, 1972. This application Apr. 16, 1973, Ser. No. 351,694

Int. Cl. B41j *33/14*

U.S. Cl. 197—151 **5 Claims**



2. In a printing machine of the type having:

1. at least one print element;

2. means for mounting a ribbon in the printing machine, the ribbon mounting means having projecting members to hold a portion of the ribbon between the projecting members;

3. a first bell crank pivotally mounted in the printing machine and engaging the ribbon mounting means;

4. a cam follower;

5. means for connecting the cam follower to the first bell crank;

6. means for imparting motion;

7. a cam connected to the motion imparting means and engaged by the cam follower to oscillate the projecting members to move the portion of the ribbon held by the projecting members from a home position to a print position for impact by the print element to print on a record medium; and

8. a rotor in contact with the ribbon; wherein the improvement comprises:

a second bell crank having a cam arm and a pawl arm and pivotally connected to the first bell crank, the cam arm of the second bell crank having a cam slot engaging a stud in the printing machine and the pawl arm of the second bell crank positioned to engage the rotor to feed the ribbon during oscillation of the projecting members.

3,863,750

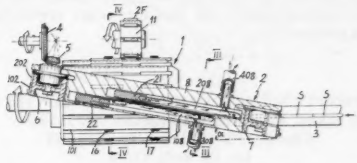
DEVICE FOR FORMING PAIRS OF AXIALLY ALIGNED CIGARETTES WITH AN INTERPOSED DOUBLE FILTER

Filippo Giatti, Bologna, Italy, assignor to AMF Incorporated, White Plains, N.Y.

Filed Jan. 31, 1973, Ser. No. 328,493

Int. Cl. B65g *47/00*

U.S. Cl. 198—20 C **9 Claims**



1. A device for continuously moving rod-like articles in an orderly manner and for reorienting the articles being moved, comprising:

means for providing a linear path for a row of rod-like articles disposed end to end in axial alignment and advancing in an axial direction along said linear path;

means for receiving pairs of said articles in spaced axial alignment substantially parallel to the linear path with the interspace between the spaced ends of the articles of each pair being of predetermined length, and for moving said pairs of articles in a direction lateral to their axes;

means for transferring pairs of said articles from the row advancing along the linear path to said receiving means; said receiving and transferring means each being provided with controlled vacuum means for selectively holding said pairs of articles while being moved thereby; and means for providing rod-like members to said receiving means each being positioned in axial alignment in the interspace between a spaced pair of said rod-like articles.

3,863,751

FEEDING DEVICES FOR TEXTILE MACHINES

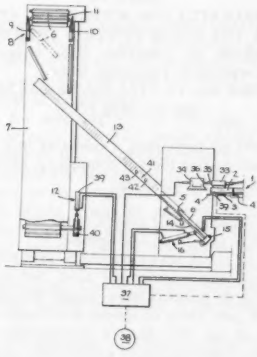
Louis Vignon, Geneva, Switzerland, assignor to Heberlein Hispano S.A., Vernier-Geneva, Switzerland

Filed Feb. 20, 1973, Ser. No. 333,472

Claims priority, application Luxembourg, Feb. 25, 1972, 64841

Int. Cl. B65g *47/52*

U.S. Cl. 198—27 **9 Claims**



1. In apparatus for feeding empty bobbins each having a head at one end, to a bobbin changing device including spaced bobbin gripping means and means for advancing same, means for orienting bobbins for engagement of the heads by the

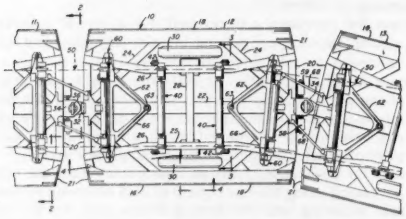
gripping means, bobbin carrying means mounted for pivotal movement between first and second positions and adapted to receive oriented bobbins from said orienting means when in said first position, drive means pivoting said carrying means to said second position to effect presentation of said bobbin heads to the advancing gripping means, means for urging the pivot axis of said carrying means in a direction to complete presentation of the bobbins to the gripping means at the end of the excursion of said carrying means from said first to second position, and retaining means rendering said urging means ineffective until said carrying means approaches its second position.

3,863,752

SUPPORT UNIT FOR A MOBILE BELT CONVEYOR

John R. Sibley, 401 Circle St., Franklin, Pa. 16323

Filed Feb. 5, 1973, Ser. No. 329,629
Int. Cl. B65g *41/00*
U.S. Cl. 198—109 **13 Claims**



1. A conveyor train comprising: a series of support sections having portions cooperable to support a horizontally flexible conveyor belt to permit conveying of material along a generally horizontal elongated path; said support sections pivotally connected and relatively movable to vary the configuration of said path; adjacent portions of at least certain ones of said support sections having belt supporting means carried thereby and means mounting said belt supporting means for movement transversely and horizontally of said path; and connecting means connecting said adjacent sections and said belt supporting means to move said belt supporting means in said transverse and horizontal manner upon said relative movement of said certain ones of said support sections.

3,863,753

CHUCK APPARATUS FOR SUPPORTING CONTAINERS BY THE FINISH PORTION THEREOF

Herbert C. Shank, Jr., Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed May 10, 1973, Ser. No. 358,864
Int. Cl. B65g *19/00*
U.S. Cl. 198—179 **6 Claims**

1. Apparatus for supporting a container in a vertical position by a finish portion thereof comprising, in combination,

a chuck assembly comprising:

a spindle,

means for mounting said spindle vertically,

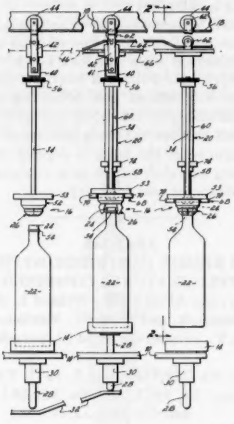
a chuck body carried by said spindle,

a plurality of chuck jaws mounted by said body for pivotal movement about horizontal axes, between a radially outward open position and a radially inward closed position, said jaws being so shaped that when in said closed position in use they form a substantially closed mask about the finish portion of a container supported by the chuck assembly,

and an annular sleeve shiftable along said spindle and operative to engage and cam said jaws to pivot about the horizontal axes thereof from said open position to said closed position,

each said jaw including a lip portion adapted to engage said finish portion when in said closed position so that said jaws support said container,

the mounting of each said jaw for pivotal movement being such that each jaw is biased by the force of gravity to



pivot from said closed position outwardly toward said open position when said sleeve is out of engagement therewith;

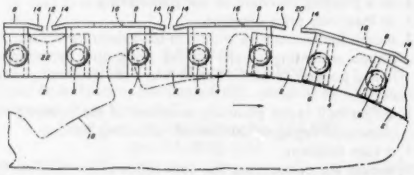
vertically movable means for shifting said sleeve along said spindle into and out of closing engagement with said jaws, and support means for said vertically movable means.

3,863,754

FLAT WIRE CONVEYOR BELT WITH IMPROVED COVERING

Carmen J. Van Lake, Waukegan, Ill., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 24, 1972, Ser. No. 299,989
Int. Cl. B65g *17/06*
U.S. Cl. 198—195 **2 Claims**



1. In a conveyor belt having flat wire links joined together by pintle rods an improved covering providing for hindrance free transverse and longitudinal sliding movement of the objects to be conveyed while on the moving conveyor belt comprising

a plurality of generally flat rectangular cover plates with each of said cover plates fastened to the top surface of an alternate link of the belt,

said alternate links having a height greater than the links connecting the alternate links whereby openings are created below the top surface of the alternate links,

said cover plates having the surface adjacent the transverse edges extending slightly downward into the adjacent opening and

with each of said cover plates having straight continuous transverse edges with each edge nearly meeting the edge

of the adjacent cover plate thereby providing a smooth surface for sliding objects over the face of the belt.

3,863,755

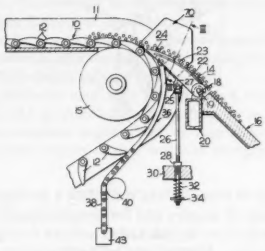
END STRIPPER FOR A TRAVELING GRATE CONVEYOR

Walter J. Hartwig, Hartland, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 356,049, April 30, 1973, Pat. No. 3,815,727. This application Nov. 9, 1973, Ser. No. 414,405

Int. Cl. B65g *45/00*

U.S. Cl. 198—230 **10 Claims**



1. An end stripper adapted to strip material being processed from the discharge end of a grate conveyor, said end stripper comprising a main body member adapted to be supported by stationary support structure at a location in spaced relation from the stripping end of said stripper, a detachable side wall member positioned at a lateral edge of said end stripper, cooperating means carried by said side wall member and by said main body member for slidably detachably interlocking said side wall member with said main body member of said end stripper, and a replaceable stripper tip adapted to be detachably mounted on said main body member at the stripping end of said stripper, said replaceable stripper tip when assembled on said end stripper being in obstructing relation to detaching movement of said side wall member whereby to retain said side wall member in assembled relation on said end stripper, said stripper tip being provided with means adapted to be connected to a normally downwardly acting tension means whereby the tension means when connected to said stripper tip acts to engage said stripper tip and said main body member in firmly assembled relation with each other.

3,863,756

RECIPROCATING CONVEYOR

Lucas J. Conrad, Winston-Salem; Gerard E. Leonard, Kernersville, and Gary J. Simmons, Westfield, all of N.C., assignors to R. J. Reynolds Company, Winston-Salem, N.C.

Filed Aug. 23, 1973, Ser. No. 390,969

Int. Cl. B65g *27/00*

U.S. Cl. 198—220 CC **13 Claims**

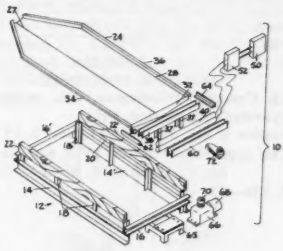
1. A reciprocating conveyor comprising:

a. pan means for carrying a live load to be transported by said conveyor;

b. means for supporting said pan means;

c. drive and release means attached to an acting on said pan means for imparting a first acceleration force to said pan means in a first direction and terminating said first acceleration force imparted to said pan means at a predetermined location; and

d. pressurized pliable, right circular cylindrical, tubular, pneumatic spring means being contacted by said drive and release means and compressed as said drive and release means imparts said first acceleration force to said pan means in said first direction, whereby energy will be stored in said tubular pneumatic spring means, said tubular pneumatic spring means imparting a second and greater accelerator force to said pan means in a second direction opposite said first direction through said drive and release means as it disengages from said tubular



pneumatic spring means, whereby the inertial force of the live load will overcome the frictional force between the pan means and the live load allowing the live load to slide in said first direction along the pan means.

3,863,757

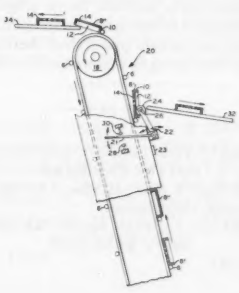
METHOD AND APPARATUS FOR ORIENTING ELEMENTS HAVING A CONCAVE PORTION

Alfred W. Kinney, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 9, 1973, Ser. No. 358,533

Int. Cl. B65g *47/24*

U.S. Cl. 198—271 **15 Claims**



1. An apparatus for recovering articles having a concave portion defined by a top and a side portion from a bulk source, orienting said articles with the concave portion of said articles directed downwardly and delivering said oriented articles to a preselected location, comprising:

first means for receiving articles from the bulk source, maintaining each individual article resting on its side portion against the supporting structure of the first means, and moving said article upwardly;

second means for receiving from the upper end of the first means an article having its concave portion directed toward the supporting structure of the first means and moving the article from the first means to preselected location, retaining the position of the concave portion of the article directed toward the structure supporting the article on the second means and at the preselected location;

third means for contacting an oriented article supported by said first means, pivoting outwardly from the first means and onto a fourth means for receiving and moving only an article having its concave portion directed outwardly from the supporting structure of the first means, said pivoted article being pivoted about its side portion; and

fourth means for receiving and moving to a preselected location an article pivoted from the first means by the third means, said pivoted article positioned on the fourth means and at the preselected location having its concave portion directed toward the structure supporting said article.

3,863,758

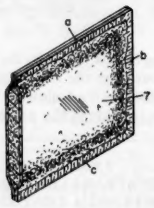
MOLDING COMPOSITIONS

Frank J. Connelly, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 194,951, Nov. 2, 1971, abandoned. This application Nov. 29, 1973, Ser. No. 420,359

Int. Cl. B32b *3/00*; **B65d** *81/00*

U.S. Cl. 206—84 **2 Claims**



1. A thermoplastic molding composition in the form of a packet consisting essentially of a blend of pulverulent thermoplastic film-forming polymer and up to 85 percent by weight of said blend of reinforcing fibers selected from the group consisting of glass fibers, asbestos fibers, graphite fibers and carbon fibers enclosed between two thermoplastic cover films of the same polymer as said pulverulent thermoplastic polymer, said cover films being heat sealed at least along the open edges.

3,863,759

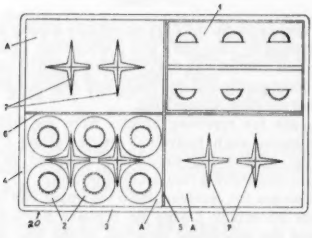
PLASTIC CRATE FOR TRANSPORTING BOTTLES IN BOTTLE CARRIERS

Ulrich Heinrich Prodel, Bad Salzuflen, Germany, assignor to Spumalit-Anstalt, Liechtenstein

Filed Oct. 18, 1973, Ser. No. 407,561

Int. Cl. B65d *75/00*

U.S. Cl. 206—203 **9 Claims**



1. Packaging for the transport of bottles, comprising a plurality of bottle carriers each holding a plurality of bottles and a plastic carton of a size to receive a plurality of said bottle carriers, said carton having side walls and a bottom, and positioning elements projecting up from the bottom of said carton and fitting between the bottles in bottle carriers placed in said carton to position said bottles and prevent them from bumping one another during transport, said carriers having openings in their bottoms through which said positioning elements extend.

3,863,760

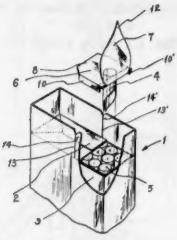
CIGARETTE PACKAGE AND CIGARETTE-EJECTION TAB DEVICE

Ryou Dong Il, No. 111 Mia-Dong, and Hong Sung Pyo, No. 46-8 Woo E-Dong, both of SungBuk-ku, Seoul, South Korea

Filed May 7, 1973, Ser. No. 357,697

Int. Cl. A24f *15/14*; **B65d** *85/10*

U.S. Cl. 206—250 **3 Claims**



2. An article of manufacture providing a package for packaging a plurality of articles and for simultaneously withdrawing a first article from the packaged articles during the opening of the package, comprising in combination: a package having a sealed opening provided with a sealing sheet material having a slit therein, a tab member extending through said slit and having a free distal end exposed to exterior space, and the tab member having a base portion structure in a shape such that it is attachable to an article adjacent to said sealed opening of the package such that upon pulling upwardly on said free distal end the sheet material is such that it will be torn away from the opening, said article being a cigarette and the tab base being of conical shape and being wedged onto an upper portion of the cigarette structure.

3,863,761

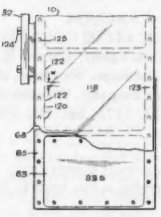
LABEL WEB

Herbert LaMers, Los Angeles, Calif., assignor to R. A. Jones & Company, Inc., Covington, Ky.

Division of Ser. No. 89,492, Nov. 13, 1970, Pat. No. 3,776,801, which is a division of Ser. No. 756,651, Aug. 30, 1968, Pat. No. 3,661,625. This application June 5, 1972, Ser. No. 259,719

Int. Cl. D06f *69/00*; **B32b** *3/10*

U.S. Cl. 206—390 **6 Claims**



1. A rolled, pre-printed, precut label supply including an elongated web supporting labels therein, for use in apparatus adapted to apply labels to products, said apparatus including means for establishing a tacky surface to one side of said labels, a reciprocating resilient plunger means for engaging labels, for passing through said web and detaching labels therefrom, for carrying labels toward and applying labels to products, and thereafter withdrawing through a web remnant, said resilient plunger means having a forward label engaging face with a predetermined shape, and sprocket means for

transporting said web through said label applying apparatus, said pre-printed, precut label supply comprising:

an elongated single-ply web in the form of a roll including a plurality of die-cut labels and a web remnant to which said labels are attached, said labels being located throughout said remnant from one end to the other of said web,

said labels being partially cut from said web remnant by a plurality of cuts extending completely through said web, the ends of said cuts being spaced apart to leave bridging means between said labels and said web remnant thereby to releasably hold said labels in said remnant,

said bridging means having predetermined widths selected to permit the detachment of said labels by said resilient plunger, transversely to said web remnant, without indiscriminate tearing of the label,

said labels having two sides, each free from adhesive, one of which sides is adapted for receiving adhesive and another side which bears printed indicia, and

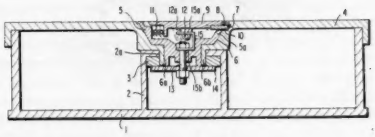
sprocket holes in said web remnant and extending therealong, said sprocket holes disposed in said remnant to permit accurate registration of said remnant and said labels with respect to said resilient plunger.

3,863,762

TAPE CONTAINER

Takuya Arai, Tokyo, Japan, assignor to Fugi Photo Film Co., Ltd., Minami Ashigara-shi, Kanagawa, Japan

Filed Sept. 7, 1973, Ser. No. 395,116
Claims priority, application Japan, Sept. 7, 1972, 47-89704
Int. Cl. A47j *27/08, 36/10*
U.S. Cl. 206—405 **11 Claims**



1. A container for a tape or the like comprising:

a body portion having a flat bottom plate, a circumferential wall fixed to said bottom plate integrally therewith, and a socket fixed to the inside surface of said bottom plate at the center thereof,

said socket having a cylindrical portion and an upper end plate, said end plate having an elongated shaped opening, a cover portion having a flat top plate, a circumferential wall fixed to said top plate thereof integrally therewith, and a recess formed at the center of said top plate, and latch means provided in the recess of said top plate,

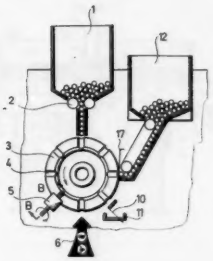
said latch means comprising a latch plate rotatable in said recess, a finger plate associated with said latch plate so as to be rotated with said latch plate, the shape of said finger plate being so formed that said finger plate may pass through said elongated opening of said socket when said finger plate is in alignment with said elongated opening and may not pass through said elongated opening when said finger plate is rotated from the position of alignment, and latch holes provided on the internal surface of said recess for holding said latch plate in predetermined positions.

3,863,763

EQUIPMENT FOR THE INSPECTION OF FILLED AMPOULES

Arpad Kollar; Istvan Takacs; Bela Sandor, and Sandor Nepper, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

Continuation of Ser. No. 300,654, Oct. 25, 1972, abandoned. This application Jan. 24, 1974, Ser. No. 436,383
Claims priority, application Hungary, Oct. 30, 1971, RI 453
Int. Cl. B07c *5/342*
U.S. Cl. 209—111.7 **9 Claims**



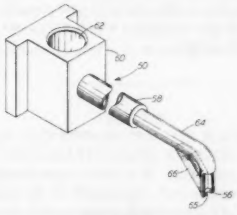
1. In an ampoule inspection device a combination comprising a rotary forwarding wheel having a frustoconical peripheral surface provided with a plurality of circumferentially spaced nests for holding ampoules therein; illuminating means adjacent said peripheral surface for illuminating ampoules located in said nests; a rotating wheel arranged adjacent said peripheral surface of said forwarding wheel ahead of said illuminating means, as considered in the direction of rotation of said forwarding wheel, for rotating ampoules in said nests about their axes; and means for feeding containers to be inspected seriatim into said nests of said forwarding wheel.

3,863,764

METHODS AND APPARATUS FOR IDENTIFYING NONMAGNETIC ARTICLES

Stephen A. Myslinski, Whitehall; Edwin J. Pritchard, Coopersburg, and Howard A. Tooker, Allentown, all of Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Feb. 28, 1974, Ser. No. 446,888
Int. Cl. B07c *5/344*
U.S. Cl. 209—111.8 **15 Claims**



1. A method of identifying nonmagnetic articles which comprises the steps of:

coating the article with a material which is capable of retaining a magnetic flux when magnetized;

testing the articles individually to determine which articles are to be identified;

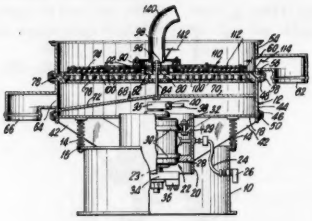
and contacting the individual articles to be identified in accordance with the testing, with a tip of a marking member having a magnetic flux concentrated at the tip thereof to magnetize the material and identify the articles.

3,863,765

ANTI-BLINDING WIPER ASSEMBLY FOR VIBRATORY SEPARATOR

Eric G. Gray, 46 Flavian Crescent, Willowdale 428, Ontario, Canada

Filed May 8, 1972, Ser. No. 251,006
Int. Cl. B07b 1/52
U.S. Cl. 209—323 21 Claims



1. A wiper assembly for a vibratory separator including a generally horizontal separator screen mounted in an annular casing, said wiper assembly comprising:

an annular cover means of small diameter than said annular casing, for inhibiting splashing of material on said separator screen, said cover means being disposed above the separator screen and movable relative thereto, said cover means including an opening for enabling the substance to be separated to be passed to the region intermediate the cover means and the separator screen;

a feed pipe means for introducing said substance to be segregated to said opening in said cover means, said feed pipe means extending to an elevation which is lower than the elevation of the top of said opening whereby the lower portion of said feed pipe limits the excursion of said wiper assembly within an area which is approximately concentric with said annular casing; and

a plurality of wiper members secured to the underside of said annular cover means, said wiper members being operative to space the cover means from the screen to enable said substance to move along the upper surface of the screen, and said wiper members being operative, during operation of the separator, to move with the cover means relative to the screen in such manner as to dislodge portions of the substance which may coat the upper surface of the screen.

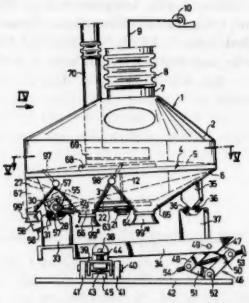
3,863,766

METHOD AND APPARATUS FOR SORTING AND SEPARATING GRANULAR MIXTURE

Hans Oetiker, Salisstr. 4 CH-900 St. Gallen, Switzerland

Continuation of Ser. No. 167,933, Aug. 2, 1971, abandoned.
This application Dec. 27, 1973, Ser. No. 428,890
Claims priority, application Switzerland, Aug. 3, 1970, 11641/70
Int. Cl. B07b 4/08
U.S. Cl. 209—469 3 Claims

1. In apparatus for sorting and separating a minority of grains, having a low suspension velocity, and a majority of grains, having a higher suspension velocity, from mixtures of granular material, under the influence of swinging-throw movements of a plane inclined gas-permeable support and of an air current flowing upwardly through the support, and of the type including a feeding device extending to an inlet on the plane inclined gas-permeable material support, a swingable bearing carrying the material support, a swing drive operatively associated with the material support to produce the swinging-throw movements, means producing an air current flowing upwardly through the support, and outlets, for the minority grains and the majority grains, adjoining the material support: the improvement comprising, in combination, the swinging movement of said support establishing a direction of conveyance, for the discharge of the majority grains, extending from said inlet horizontally and laterally; the outlet for the majority grains being arranged in said horizontal region; means providing a flow region on the material support, located downwardly from said horizontal region, for the floating evacuation of the minority grains on the material support extending between the material fall line on said support extending through the inlet with the steepest inclination and a line on said support having an inclination which is one-half the



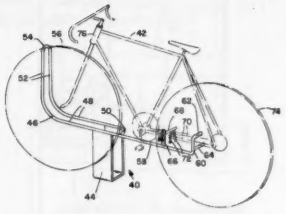
inclination of the fall line and intersecting the inlet; the outlet for the minority grains being arranged in said last-mentioned flow region; the direction of the swinging-throw movements produced by said swing drive being oriented at an acute angle to and in the direction of conveyance; the bearing carrying said swingable material support being adjustable in height both in the direction of the swinging-throw movements and at a right angle thereto, to vary the inclination of the material support with respect to a fixed base; the bearing for said material support having three support members provided with swinging elements; said three support members being connected, on one side of said swinging elements, to the swingable part of said apparatus and, on the other side of said swinging elements, to a first rocker; a second rocker; means pivotally mounting said first rocker on said second rocker; a fixed base; means pivotally mounting said second rocker on said fixed base; the axis of said last-named pivotal mounting means extending horizontally and parallel to the direction of the swinging-throw movements, and the axis of said first mentioned pivotal mounting extending at a right angle thereto; and means operatively associated with each rocker and operable to adjust the inclination thereof.

3,863,767

BICYCLE SECURITY RACK

William Guy Garwood, 1650 Waverly St., Palo Alto, Calif. 94301

Continuation-in-part of Ser. No. 223,581, Feb. 4, 1972, abandoned. This application Dec. 13, 1973, Ser. No. 424,509
Int. Cl. E05b 71/00
U.S. Cl. 211—5 10 Claims



1. A bicycle security rack comprising: front wheel securing means including a horizontal U-shaped portion and a generally vertical U-shaped portion in combination for limiting movement of the front wheel of an upright two-wheel bicycle forwardly and transversely when said wheel is inserted therein; rear wheel securing means extending aftwardly from and fixed to the front wheel securing means; arm means extensible transversely from the rear wheel securing means, said arm means adapted to be extended to a position slightly above and at least partially spanning the chain stays of a two-wheel bicycle when the front wheel of said bicycle is inserted in the front wheel securing means so that said arm means extends through the spokes of the rear wheel of said bicycle, said arm means including depending portions adapted to coact with said chain stays; and means for locking the arm means in its extended position to prevent removal of each of the wheels and frame of said bicycle, either individually or assembled, when said bicycle is inserted in said rack.

3,863,768

Patent Not Issued For This Number

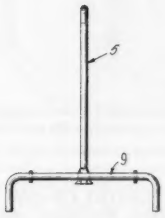
3,863,769

STRUCTURAL MEMBERS FOR PROVIDING RELEASABLE CONNECTIONS AND STRUCTURES INCORPORATING THE MEMBERS

Norman H. Goddard, Chateauquay Center, Quebec, Canada, assignor to JCN Wire Industries Ltd., East Montreal, Canada and JCN Wire Industries Ltd., Quebec, Canada

Filed Dec. 4, 1972, Ser. No. 311,553
Claims priority, application Canada, Sept. 21, 1972, 152300
Int. Cl. A47f 5/10
U.S. Cl. 211—182 8 Claims

1. A pair of elongated structural members adapted to be connected together, one of said members having a main tubular section and a connecting section at one end of the tubular section, the connecting section being integral with and forming a deformed extension of said main tubular section, the connecting section having a pair of spaced apart, elongated portions and a web section joining the elongated portions, said web being formed integrally with said elongated portions and comprising a pair of adjacent wall sections, extensions of said wall sections forming a merging section flaring outwardly from the connecting section to the main tubular section and being joined integrally with said main tubular section, the elongated



portions extending substantially parallel to, and substantially symmetrically about, the longitudinal axis of the one member, the other member having aperture means for receiving the connecting section of the first member, the shape and size of said aperture conforming substantially with the cross-sectional shape and size of the connecting section, whereby, when the connecting section of said first member is inserted in the aperture of said second member and forced in the direction of said second member, the first member will be releasably held in said second member by frictional engagement between edges of said aperture and said merging section of said web.

3,863,770

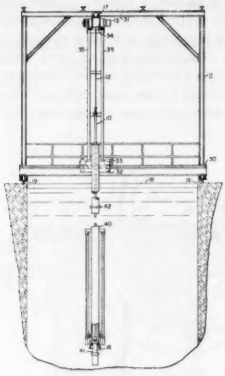
METHOD AND APPARATUS FOR HANDLING AN IRRADIATED FUEL ASSEMBLY

John M. Shallenberger; Robert E. Meuschke, and Walter E. Desmarchais, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 11, 1973, Ser. No. 350,243
Int. Cl. B66c 5/02, 1/28
U.S. Cl. 212—14 13 Claims

1. Apparatus for handling irradiated fuel assemblies of a nuclear reactor during underwater transfer operations, said apparatus comprising means for lifting and lowering a fuel assembly, means for moving the fuel assembly in a horizontal direction, first support means for structurally supporting the fuel assembly during the handling operations, said first support means including apparatus for grasping the fuel assembly, and second support means for redundantly supporting the fuel

assembly, said second support means including apparatus for redundantly grasping the fuel assembly, said redundant grasp-



ing apparatus being activated so as to engage the fuel assembly by lifting of the fuel assembly with said lifting means.

3,863,771

GANTRY CRANES

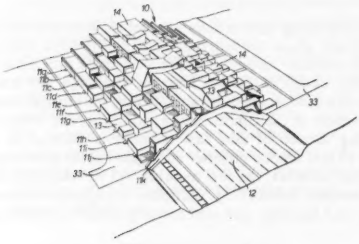
Charles Herbert Dobbie, Winchelsea, and John David Winders, Epsom, both of England, assignors to Charles Herbert Dobbie, Winchelsea; Thaddeus Marian Prus-Chacinski, London; Norman Ivor Pallett, Tonbridge; John David Winders, Epsom and William Brown Harris, Penarth, all of England

Filed Dec. 6, 1973, Ser. No. 422,323

Claims priority, application Great Britain, Dec. 8, 1972, 56876/72

Int. Cl. B66c *19/00*

U.S. Cl. 212—14 **7 Claims**



1. A movable gantry crane useful in the erection of a structure comprising several bridge-like sub-structures arranged side by side in spaced relationship; which crane comprises a girder long enough to span the structure, supported by movable supporting columns, at least two sets of hangers which suspend a platform from the girder in a position to lie beneath a bridge-like sub-structure to be erected with the aid of the crane, at least one set being disposed to occupy a position in front of the said sub-structure and at least one other set being disposed to occupy a position to the rear of the said sub-structure, a lifting device movable along the girder between sets of hangers disposed to occupy positions respectively in front of and to the rear of the said sub-structure, and the hangers of the said other set or sets being removable or displaceable to permit the crane including the platform to be moved forwards when this sub-structure has been made self-supporting and laterally stable.

3,863,772

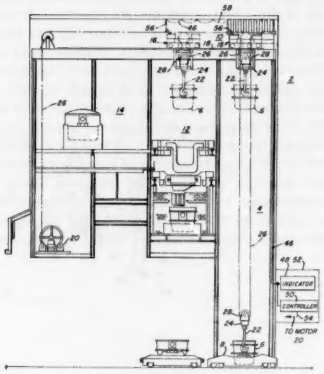
CRANE HOIST HEIGHT CONTROL

George F. Schwartz, Hampton Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 2, 1973, Ser. No. 328,976

Int. Cl. B66c *17/18*

U.S. Cl. 212—21 **3 Claims**



1. A crane hoist height signal system for a crane having a hoist block comprising

a cable having one end attached to the hoist block,

a revolving drum mounted on the crane and attached to the other end of the cable for winding and unwinding the cable as the hoist block is raised and lowered,

a shaft attached to the drum to revolve with the drum,

a constant torque spring motor attached to the shaft for continuously applying a force to the drum tending to wind the cable onto the drum,

a pulse generator attached to the shaft for providing a first type pulse for each predetermined increment of winding the cable and a second type pulse for each predetermined increment of unwinding the cable and

means connected to said pulse generator for adding the first type pulses and subtracting the second type pulses from a predetermined total correlated with a selected hoist block height thereby providing a pulse total representative of the hoist block height.

3,863,773

ROTARY TOWER CRANE SUITABLE FOR HIGHWAY TRANSPORTATION

Elmar Reich, Biberach an der Riss, and Alfons Kohle, Pflummernstrasse, both of Germany, assignors to Hans Liebherr, Biberach an der Riss, Germany

Filed July 9, 1973, Ser. No. 377,757

Claims priority, application Germany, July 10, 1972, 2233828

Int. Cl. B66c *23/62*

U.S. Cl. 212—46 B **7 Claims**

1. A tower crane comprising:

a tower having a lengthwise axis adapted to stand vertically during hoisting operations of said crane;

a boom for hoisting, having a lengthwise axis adapted to extend transversely from the lengthwise axis of said tower during hoisting operations of said crane;

means supporting said boom in said transverse position during hoisting operation of said crane;

means to move said lengthwise axis of said boom to a position substantially coaxial with said lengthwise axis of said tower, comprising:

boom actuating means extending transverse from the lengthwise axis of said boom;

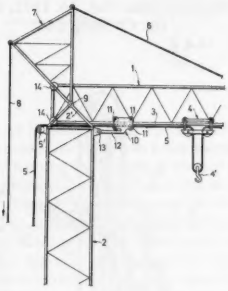
means pivotally connecting said boom actuating means to said tower;

means connecting said boom actuating means to said boom; and

means to pivot said boom actuating means about said tower to raise said boom and thereby bring said lengthwise axis of said boom into alignment with said lengthwise axis of said tower;

means to move said boom at least partially into said tower in coaxial telescoped relationship to said tower, comprising:

line means operatively associated with said boom for hoisting operation of said crane;



guide means connected to said tower and adapted to hold said line means in contact with a guide means on said boom;

guide means on said boom vertically spaced when said boom is in its horizontal positions, said guide means adapted to engage said line means when said boom is disposed with its lengthwise axis aligned with said lengthwise axis of said tower; and

said tower guide means and said boom guide means relatively disposed to allow said boom to move into and out of said tower upon lengthening and shortening of said line means; and

means to guide movement of said boom when moving into and out of telescope relationship with said tower.

3,863,774

SKYLINE CARRIAGE

Dennis L. Brandt, Broken Bow, Okla., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 18, 1974, Ser. No. 452,022
Int. Cl. B66c *21/00*
U.S. Cl. 212—94 **3 Claims**

1. A skyline carriage of the type with first and second sides and a bottom adapted to traverse a skyline cable and having mainline and haulback cables in operative communication therewith together with means to independently actuate said mainline and haulback cables with the improvement comprising:

means within the carriage to direct the mainline cale from its entry point at the first side of said carriage to the bottom thereof such that a portion of said mainline cable extends downwardly from the bottom of said carriage,

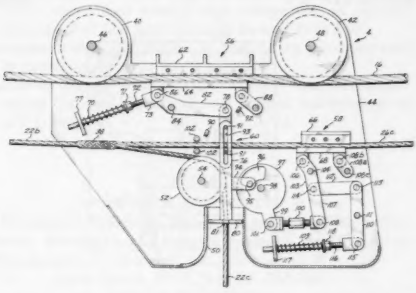
means to direct the haulback cable from its entry point at the second side of said carriage toward said first side,

means to join the end of said haulback cable to said mainline cable at a position which is above said mainline cable directing means and generally in the same plane therewith, and

a locking mechanism for sequentially locking and unlocking said carriage to said skyline cable and to said haul-back cable comprising:

means to sense a vertical position of the downwardly extending portion of said mainline cable,

first means responsive to said sensing means to lock the carriage to the hualback cable and to substantially simultaneously unlock the carriage from said skyline cable



when the downwardly extending portion of the mainline cable is substantially in its uppermost position, and

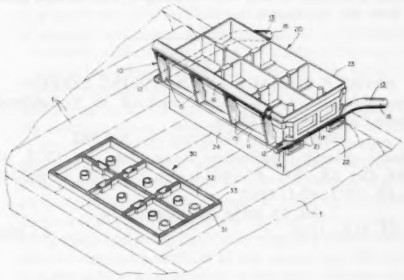
second means responsive to said sensing means to lock the carriage to the skyline cable and to substantially simultaneously unlock the carriage from said haulback cable when the downwardly extending portion of the mainline cable is in a lower vertical position with respect to its uppermost position.

3,863,775

METHOD AND APPARATUS FOR INVERTING OPERATIONS ASSOCIATED WITH THE ASSEMBLY OF A STORAGE BATTERY

Henry Toback, New Ringgold, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed Nov. 9, 1973, Ser. No. 414,520
Int. Cl. B65g *7/00*
U.S. Cl. 214—1 QE **12 Claims**



1. Apparatus for use in inverting operations associated with the assembly of a storage battery, comprising:

a. a rigid base having spaced-apart ends;

b. a pair of handle means pivotally connected to said base so as to be capable of movement toward and away from each other relative to said base and configured for lifting engagement of said battery therebetween; and

c. roll-over support means rigidly associated with said base adapted for providing a supporting axis about which said battery, upon engagement by and upward lifting of said handle means, can be rolled over and rotated as much as 180°, whereby said battery is inverted from its original unengaged position.

3,863,776

APPARATUS FOR TRANSFERRING DISCRETE LOADS TO OR FROM PALLETS

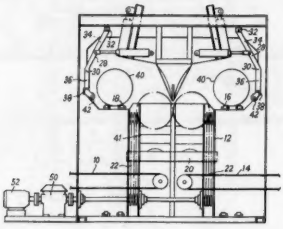
Frederick George Harman, Epping, England, assignor to The British Mathews Limited, Essex, England

Filed Apr. 11, 1973, Ser. No. 350,188

Claims priority, application Great Britain, Apr. 11, 1972, 16736/72

Int. Cl. B65g 57/26

U.S. Cl. 214—6 P **5 Claims**



1. Apparatus for transferring a plurality of discrete loads to a pallet of the kind capable of receiving two parallel rows of the discrete loads, comprising:

pallet infeed means for moving an empty pallet to a loading station;

first and second conveying means to convey loads simultaneously to respective first and second loading positions on opposite sides of said loading station so that each loading position is occupied by a similar number of loads arranged in a single row parallel to and adjacent the position on the pallet in which the loads are to be supported by the pallet;

transfer means for acting simultaneously on the two rows of loads at said loading positions to push the loads simultaneously to their respective position on the pallet while the pallet is at said loading station; means for actuating said transfer means so that the articles in each of said rows of loads are pushed simultaneously into position on the pallet; and

pallet discharge means for discharging the loaded pallet from the apparatus.

3,863,777

ARTICLE STORAGE AND HANDLING SYSTEM

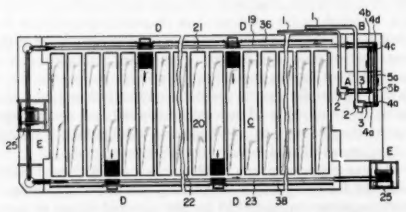
Tsuneo Murata, Tokyo, Japan, assignor to Tsubakimoto Chain Co., Osaka-shi, Japan

Filed July 18, 1973, Ser. No. 380,282

Claims priority, application Japan, July 19, 1972, 47-72369; Oct. 18, 1972, 47-10364; Oct. 23, 1972, 47-105249; Nov. 15, 1972, 47-113902

Int. Cl. B65g 1/04; B66f 9/14

U.S. Cl. 214—16 B **3 Claims**



2. Loading-and-unloading means comprising a main frame, an elevating frame guided and supported by said main frame, an L-shaped frame comprising a horizontal frame mounted on said elevating frame and moving forward and backward and a vertical frame attached to the front or rear end of said horizontal frame, a plurality of tilting frames supported, in a row, by the front portion of said vertical frame and adapted to tilt forward and backward on the fulcrum at its lower end, and a fork frame elevatingly guided and supported by said tilting frames, having a fork at its lower end, and springingly fitted to said tilting frames through a spring.

3,863,778

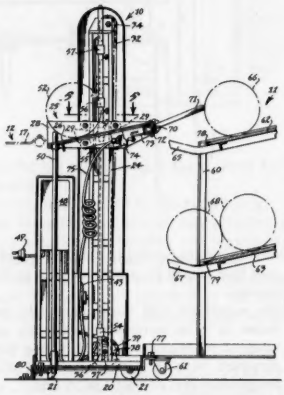
ROLL STORAGE DEVICE HAVING AN ELEVATOR WITH PIVOTAL LOAD SUPPORTING MEANS

Thomas W. Martin, Sr., Nashville, Tenn., assignor to Cutters Machine Company, Inc., Nashville, Tenn.

Continuation of Ser. No. 117,514, Feb. 22, 1971, abandoned, which is a division of Ser. No. 831,848, June 10, 1969, Pat. No. 3,601,270. This application Nov. 24, 1972, Ser. No. 309,432

Int. Cl. B65g 1/06

U.S. Cl. 214—16.4 R **5 Claims**



1. A roll loading apparatus comprising:

a. a base frame,

b. an elevator member,

c. means mounting said elevator member on said base frame for vertical reciprocable movement,

d. an elongated cradle adapted to support a roll in an elevated position,

e. means supporting said cradle adjacent said base frame,

f. at least one roll engaging finger,

g. means pivotally mounting said finger on said elevator member to normally project toward said cradle at an inclination from said elevator member, said cradle being in the vertical path of said projected finger,

h. an opening in said cradle adapted to register with each said finger to permit the vertical movement of said finger through said cradle,

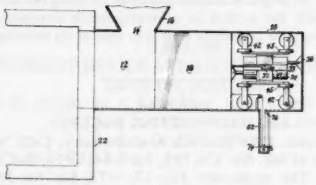
i. means limiting the pivotal movement of said finger between its normally inclined position and a raised position,

j. motive means for raising and lowering said elevator member so that when said finger is moving up through said cradle said projecting finger lifts a roll supported by said cradle causing said roll to roll down said finger toward said elevator member, and when said finger is moving down through said cradle, a roll carried by said cradle deflects said finger to said raised position.

k. a reversing limit switch on said elevator member adapted to be actuated by the pivotal movement of said finger, so that when said finger moves from its raised position to its inclined position, said reversing limit switch is actuated, said reversing limit switch being operatively connected to

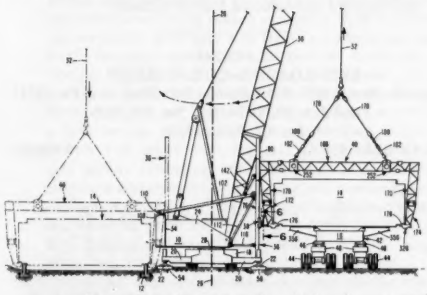
said motive means to reverse the direction of said elevator member from down to up when said reversing limit switch is actuated.

3,863,779
RAM TYPE REFUSE LOADER
Richard F. Stockman, Friendship, N.Y., assignor to The Air Preheater Company Inc., Wellsville, N.Y.
Filed Sept. 24, 1973, Ser. No. 400,086
Int. Cl. F23k *3/12*
U.S. Cl. 214—23 **5 Claims**



1. A loader for an incinerator that comprises fixed housing structure having inner walls that form a compaction chamber, an opening in said housing for loading a mass of material into said chamber, a compaction member movable along the longitudinal axis of the compaction chamber, means for moving the compaction member along the longitudinal axis of the housing between a forward position at one side of said opening and a rearward position at the opposite side of said opening including a pair of oppositely directed driving means intermediate the compaction member and the housing structure, means connecting one of said driving means to the compaction member and another to the fixed structure, a power supply for applying a driving force to said driving means, means supporting said driving means comprising support structure guided for movement along the longitudinal axis of said chamber, and trailing means guiding said compaction member along the longitudinal axis of said compaction chamber.

3,863,780
SYSTEM FOR PLACING FACTORY PREFABRICATED HOUSING UNITS
C. Robert Gottlieb, Mobile, Ala., and Eugene C. Lewis, Scotch Plains, N.J., assignors to Diamondhead Corporation, Mountainside, N.J.
Division of Ser. No. 312,575, Dec. 6, 1972, Pat. No. 3,831,770.
This application Jan. 22, 1974, Ser. No. 435,585
Int. Cl. B66c *3/00*
U.S. Cl. 214—38 CA **12 Claims**



1. A self-transportable system for placing factory prefabricated, interiorly finished housing units on lot site foundations, said system comprising:

a vehicular rotary crane having a boom and hoist line swingable about a vertical axis;

a load spreader detachably suspendable from said hoist line and including means to establish retractable, rigidly linear, foundation-like supports under opposite sides of the housing unit along the full length thereof;

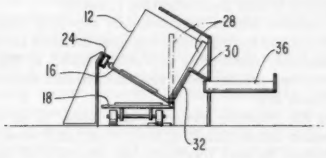
a snubbing frame mountable on said crane to move with said boom in its swinging movement about said vertical axis;

means to connect said load spreader adjustably and removably to said snubbing frame to insure movement of said load spreader directly with movement of said snubbing frame about said vertical axis irrespective of vertical movement of said load spreader by said hoist line;

vehicular transporter means for positioning a housing unit in transfer relation to said crane; and

means to mount said load spreader on said transporter means for over-land movement thereof independent of said crane.

3,863,781
ARTICLE UNLOADER
Neil W. Butzow, Greendale; Glenn J. Eggert, Cedarburg; Bert Krivec, Waukesha, and Gary J. Rollinger, Belgium, all of Wis., assignors to Rexnord, Inc., Milwaukee, Wis.
Filed Apr. 6, 1973, Ser. No. 348,785
Int. Cl. B65g *67/24*
U.S. Cl. 214—62 R **9 Claims**



1. Apparatus for unloading articles from a container while the container is being conveyed through an unloading station, said apparatus comprising:

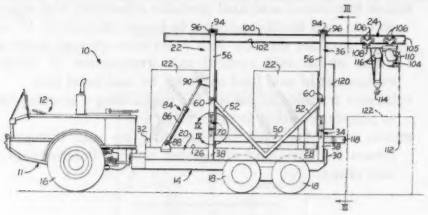
1. a first conveyor which is
   a. adapted to carry said container and
   b. adapted to tilt about a first axis parallel to the direction in which said container is to be conveyed through said unloading station while said container is being conveyed through said unloading station;
2. a retaining surface comprising a plurality of doors pivotably mounted about a second axis parallel to the direction in which said container is to be conveyed through said unloading station, said second axis being located at a height approximately equal to that of said first axis, said plurality of doors being adapted to bear against articles contained in said containers while said first conveyor is being tilted and being built in overlapping relationship so that the doors downstream of any given door will always be rotated by at least as much as that door, thereby ensuring a smooth transition from one door to the next as said container is conveyed through the unloading station; and
3. a second conveyor which is
   a. adapted to carry said articles and
   b. located in said unloading station immediately downstream of said retaining surface in a position to receive articles slid off said container,

whereby articles may be unloaded from said container while it is being conveyed through said unloading station, said articles first being retained within said container by said retaining surface while said container is being tilted and then being deposited on said second conveyor when the tilting has been fully accomplished.

3,863,782
SELF-LOADING ARTICLE TRANSPORT VEHICLE

Dale D. Sandrock, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 2, 1973, Ser. No. 375,482
Int. Cl. B60p *1/54*
U.S. Cl. 214—75 H 14 Claims

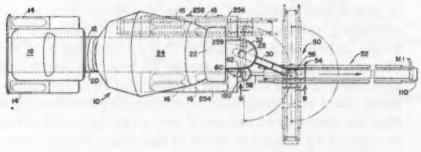


1. A self-loading article transport vehicle comprising;
an elongated load carrying bed having a predetermined load receiving end;
a frame pivotally mounted on said vehicle for movement between a substantially rigid, upstanding load receiving position above the bed and a collapsed load restraining position for articles on the bed;
a longitudinally extended rail pivotally mounted centrally on said frame and having a load receiving end extending outwardly of said load receiving end of the bed when said frame is in said load receiving position;
load transfer means longitudinally movably mounted on said rail and having a load engaging member elevationally extendably retractably movable relative to the rail for permitting articles to be loaded onto and removed from the bed; and
means for pivotally swinging said frame to its collapsed position automatically to lower said rail downwardly and to swing its load receiving end inwardly of the bed in tightly clamping load restraining engagement against articles on the bed.

3,863,783
DISTRIBUTING CONVEYOR SYSTEM FOR A ROTARY CONCRETE MIXING OR OTHER TRUCK

Francis T. Spellman, Jr., Blue Springs, Mo., assignor to Symons Corporation, Des Plaines, Ill.

Division of Ser. No. 208,682, Dec. 16, 1971,. This application Dec. 1, 1972, Ser. No. 311,225
Int. Cl. B60p *3/16*
U.S. Cl. 214—83.26 8 Claims

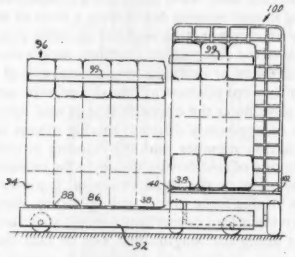


1. In combination with a vehicle having a frame structure and designed for the transport of flowable material, a support bracket having its proximate end hingedly secured to the rear end of said frame structure for swinging movement about a substantially vertical axis, a turntable mounted on the distal end of said support bracket for rotation about a vertical axis, a carrier frame mounted on said turntable for rotation bodily therewith, an longated conveyor unit of the endless belt type slidably mounted on said carrier frame for lengthwise sliding movement on the frame in opposite directions between a first extreme position wherein one end thereof is in close proximity to the carrier frame and the other end is remote therefrom, and a second extreme position where said other end is in close proximity to the carrier frame and said one end is in close proximity thereto, and a material-receiving hopper on said carrier frame, said conveyor unit, in all positions of which it is capable of assuming, remaining in effective material-receiving register with said hopper, the effective length of said support bracket being greater than the distance between the hinge connection between the bracket and frame structure and the lateral side of said vehicle frame structure, whereby the distal end of the support bracket overhangs said rear end of the vehicle frame structure in a transverse direction when the support bracket is swung to a transversely extending position with respect to the vehicle, the turntable being rotatable throughout an angle of sufficient extent to bring the conveyor unit alongside the vehicle in a longitudinally extending relationship when the conveyor unit is in one of its extreme positions.

3,863,784
LOAD SUPPORTING PALLET

Wells A. Webb, 1788 Shattuck Ave., Berkeley, Calif. 94709

Division of Ser. No. 133,795, April 14, 1971, Pat. No. 3,763,792. This application July 17, 1973, Ser. No. 380,104
Int. Cl. B65d *57/00*
U.S. Cl. 214—10.5 R 12 Claims

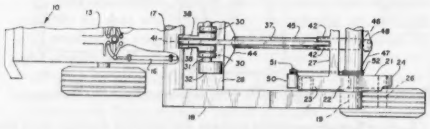


1. A method of handling a cargo comprising a plurality of indivdual cartons, said method comprising the steps of:
providing a load supporting pallet comprising a plurality of adjacently positioned individual sections connected together by severable connecting means;
placing cartons on said pallet in tiers corresponding to said individual sections to thereby separately load said individual sections;
selecting and moving a predetermined number of said loaded sections less than said plurality of sections; and
severing the connecting means between said selected tiers and adjacent non-selected loaded sections.

3,863,785
SELF-LOADING COIL CARRIER

Gibson E. Brock, R.D. 5 Persimman Rd., Sewickley, Pa. 15143

Filed Jan. 22, 1974, Ser. No. 435,442
Int. Cl. B66c *23/00*
U.S. Cl. 214—130 C 9 Claims



1. Trailer apparatus adapted for carrying coils of steel strip and the like comprising a pull yoke, a pair of draft beams spaced from each other connected with the pull yoke and

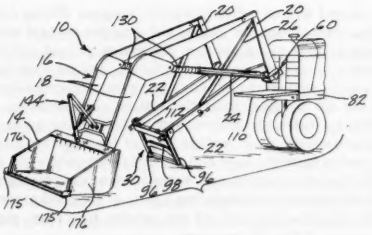
extending rearwardly therefrom, a load-straddling rack including a pair of legs, a wheel assembly journaled at the lower end of each leg, outwardly thereof, a cross member spacing the upper ends of the legs, means pivotally mounting the rack between the draft beams at the upper ends of the legs so as to rock from a traveling position in which the legs are upright to a loading position in which the legs are folded forwardly against the draft beams, and a ram adapted to support a coil of steel strip through the eye thereof affixed at one end to the draft beams adjacent the pull yoke and extending rearwardly thereof below the draft beams and substantially parallel thereto.

3,863,786

IMPLEMENT DEVICE AND METHOD OF MOUNTING SAME ON TRACTOR

Eldon M. Frank, Rt. 1, Lake View, Iowa 51450

Filed June 7, 1972, Ser. No. 260,465
Int. Cl. E02f 3/70
U.S. Cl. 214—131 A **24 Claims**



1. In combination a tractor and implement comprising, a subframe having side frame members positioned in a plane below said tractor,

the rear ends of said side frame members being connected to the opposite ends and under said tractor rear axle, the forward ends of said side frame members being connected to said tractor substantially midway along its length, said forward end connection of said subframe to said tractor including means extending both horizontally and vertically from said side frame members and operatively engaging said tractor to provide horizontal and vertical stability for said subframe, said means extending horizontally from said side frame members and operatively engaging said tractor is further defined as including a horizontally disposed member extending under said tractor and interconnecting said side frame members, said means extending vertically from said side frame members and operatively engaging said tractor is further defined as including a pair of vertically disposed upstanding members extending operatively from said side frame members on opposite sides of said tractor into engagement with said tractor on opposite sides thereof,

an implement support pad being provided on the forward ends of each of said side members, and

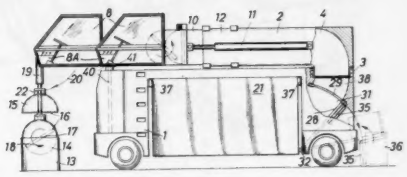
said implement having frame members extending along opposite sides of said tractor, said implement frame members having their lower rear ends supportably engaging said implement support pads.

3,863,787

REFUSE-COLLECTING VEHICLE INCLUDING PICK-UP MEANS

Herbert Ertl, Starnberg, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed May 18, 1973, Ser. No. 361,511
Claims priority, application Germany, May 20, 1972, 2224870
Int. Cl. B65f 3/02
U.S. Cl. 214—302 **14 Claims**



1. A refuse-collecting vehicle for emptying household refuse containers and for receiving refuse therefrom, said vehicle having steerable wheels, comprising:

means defining a refuse receiving chamber mounted on said vehicle;

boom means mounted on said vehicle and including refuse conveying means for conveying refuse into said refuse receiving chamber and support means therefor including means defining a vertical hinge axis for supporting said boom means at one end for pivotal movement relative to said vehicle about said vertical axis;

attachment means mounted on said free end of said boom means for engaging a refuse container;

sweeping means mounted on said attachment means for removing refuse from said refuse container and delivering same to said refuse conveying means whereby refuse is first swept out of said refuse container into said attachment means and subsequently swept into said conveying means; and

means defining a control cabin enclosed on all sides, top and bottom and having transparent panel means, said control cabin having boom control means mounted therein, said control cabin being mounted on said free end of said boom means for movement therewith and for facilitating a close supervision through said transparent panel means of the placement of said attachment means to permit an operative engagement of said attachment means to said refuse container.

3,863,788

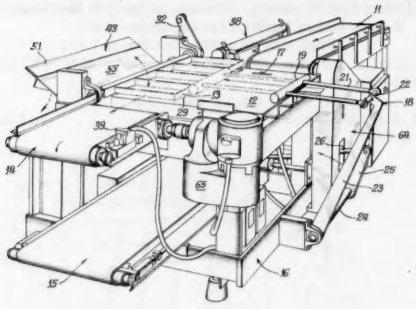
DEPANNING MACHINE

Alfred L. Meyer, Libertyville, Ill., assignor to Anetsberger Brothers, Inc., Northbrook, Ill.

Filed June 27, 1973, Ser. No. 373,973
Int. Cl. B65g 47/82
U.S. Cl. 214—302 **12 Claims**

1. A machine for removing biscuits from baking pans, comprising a platform, infeed conveyor means for serially delivering biscuit-containing pans to said platform, pan swinging means mounted adjacent a lateral edge of said platform, loader means operable in response to delivery of a pan by said conveyor means to said platform to move said pan laterally onto said pan swinging means to enable the latter to turn said pan over to dump the biscuits therefrom and return the thus emptied said pan to said platform, a second conveyor means, pan ejector means operable to move said emptied pan from said platform onto said second conveyor means, a third biscuit conveyor means below and longitudinally aligned with said infeed conveyor means, and transfer means normally disposed in substantial horizontal alignment with said platform for receiving said biscuits from said pan, as the latter is turned

over by said pan swinging means, and means for lowering said transfer means below said infeed conveyor means and tilting



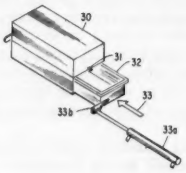
the same inwardly to deposit said biscuits onto said biscuit conveyor means.

3,863,789

MAIL TRAY UNLOADING

Edward T. Hunter, Dallas, and William C. Monday, Rowlett, both of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.

Filed Aug. 3, 1973, Ser. No. 385,466
Int. Cl. B65g *65/04*
U.S. Cl. 214—314 **11 Claims**



1. A mail tray unloader which comprises
a box having the bottom half of both ends open for entry at one end onto the bottom of said box of a tray filled with an ordered stack of edge supported mail pieces and delivery of said stack from the other end,
means to rotate said box about a longitudinal axis to drop said stack from said tray,
means to prevent reordering of said stack during said drop, means to eject the inverted tray from said box,
means to rotate said box to its upright position to deposit said stack onto said bottom of said box,
means to prevent reordering of said stack during said deposit, and
means to sweep said stack from said box through said other end.

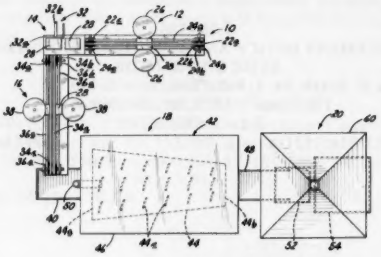
3,863,790

WRAPPER REMOVAL APPARATUS

Joseph S. Kanarek, 5435 W. 63rd St., Chicago, Ill. 60638

Filed Apr. 20, 1973, Ser. No. 352,897
Int. Cl. B65g *65/04*
U.S. Cl. 214—305 **6 Claims**

1. Apparatus for separating a solid article from its wrapper, said article having a thickness such that the wrapper can be slit along its sides, comprising: conveyor means for moving in one direction a wrapped solid article, having a thickness such that the wrapper can be slit along its sides, to a first wrapper slitting station, said conveyor means including vertically spaced apart members between which the wrapped article is engaged for movement to the wrapper slitting station, said members serving to support the wrapped article and to maintain it in a properly oriented position as it is conveyed in said one direction to the first wrapper slitting station, wrapper slitting means at said first station for slitting the wrapper on the article on opposite sides along one dimension of the article, conveyor means for moving the wrapped article in another direction to a second wrapper slitting station, said last mentioned conveyor means including vertically spaced apart members between which the wrapped article is engaged for movement to the second wrapper slitting station, said members serving to support the wrapped article and to maintain it in a properly oriented position as it is conveyed in said other direction to



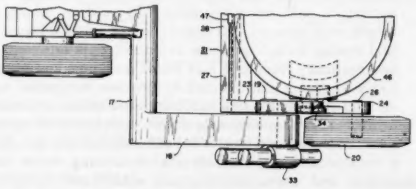
the second wrapper slitting station, wrapper slitting means at said second station for slitting the wrapper on said article on opposite sides along another dimension of said article, and wrapper separating means for removing the slit wrapper from the article, including tumbling means for mechanically removing the slit wrapper from the article, said tumbling means includes a rotatable open-ended basket having guide means arranged on the inner surface thereof for directing articles in the basket from the inlet end thereof to the outlet end thereof as the basket is rotated, said wrapper separating means further including means for producing a zone of reduced pressure for facilitating the recovery of the articles free from pieces or fragments of the slit wrapper.

3,863,791

SELF-LOADING SLAG POT TRANSPORTER

Gibson E. Brock, R.D. 5 Persimman Rd., Sewickley, Pa. 15143

Filed May 1, 1974, Ser. No. 465,863
Int. Cl. B65g *65/04*
U.S. Cl. 214—314 **7 Claims**



1. Trailer apparatus for transporting slag pots and the like provided with trunnions, comprising a pull yoke, a pair of spaced-apart draft beams connected with the pull yoke and extending rearwardly therefrom, a generally U-shaped slag pot-carrying rack pivotally mounted between the draft beams at their rear ends, the pivots being positioned intermediate the cross-member of the U and the ends of its legs, an independent wheel assembly mounted at the end of each leg of the U, means for grasping a slag pot trunnion carried by each leg of the U, positioned intermediate the pivot and the wheel assembly, and means attached to the draft beams for rocking the

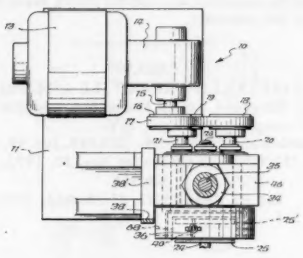
rack from a loading position in which the wheel assemblies are rearward of the pivots through an intermediate traveling position to a dumping position in which the wheel assemblies are forward of the pivots, and means mounted on said U-shaped rack for movement therewith which causes the slag pot to dump when said U-shaped rack is pivoted.

3,863,792

MACHINE TOOL

John F. Kopczynski, 1671 Sweeney, North Tonawanda, N.Y. 14120

Filed May 2, 1973, Ser. No. 356,616
Int. Cl. B65g *7/00*
U.S. Cl. 214—340 **10 Claims**



1. A machine tool for rotatably mounting a workpiece having spaced cylindrical portions comprising a base, first and second shafts mounted in spaced substantially parallel relationship on said base, first and second roller means mounted on said first and second shafts, respectively, for rotatably engaging said workpiece, a third shaft mounted on said base in generally parallel relationship to said first and second shafts, axially spaced third and fourth roller means mounted on said third shaft for rotatably engaging said workpiece, said first, second, third and fourth roller means being oriented relative to each other to receive said workpiece therebetween, and pivot means providing a pivot axis extending generally radially relative to said third and fourth roller means for permitting said third and fourth roller means to pivot toward and away from said first and second roller means whereby said third and fourth roller means will maintain engagement with spaced portions of said workpiece irrespective of slight differences in diameter of said spaced portions.

3,863,793

MINING SHIELD-SUPPORTING CARRIER

Masao Fujimori, Tokyo, Japan, assignor to Taiheiyo Coal Mining Co., Ltd., Tokyo, Japan

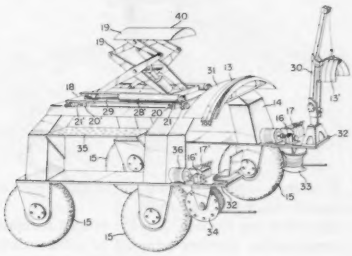
Filed Nov. 23, 1973, Ser. No. 418,568
Claims priority, application Japan, Dec. 18, 1972, 47-126266
Int. Cl. B60p *1/00*
U.S. Cl. 214—518 **1 Claim**

1. A mining shield supporter (1) carrier for expanding and collapsing mining shields used at a mine workface so as to leap-frog a rear shield under a forward shield to continuously place shields at the workface as cutting work progresses, comprising in combination:

a. an arch-shaped frame (14) to allow passage thereunder of a cutting machine;

b. wheels (15) mounted at the lower portion of a frame depending from said arch-shaped frame;

c. first and second sliding mechanisms mounted on a top portion of said arch-shaped frame, including a pair of parallel spaced apart first guide members (20,20'), a sliding plate (22) held by and disposed to move longitudinally along said first guide members, a pair of parallel spaced apart second guide members mounted on the upper surface of said sliding plate (22) normal to said first guide members, a sliding base member (25) held by and disposed to move longitudinally along said second guide members, first and second sets of cylinders and pistons (27,28) disposed to move said sliding plate and sliding base member along the respective first and second guide members;



d. a lift mechanism mounted on said sliding base member including a zig-zag upwardly telescoping section and a top section, cylindrically curved in the longitudinal direction;

e. a curved beam storing unit disposed adjacent said lift mechanism on which to store beams used for making a mining shield; and,

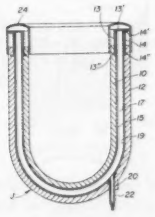
f. a crane mounted rearwardly of said arch-shaped frame to lift said beams for storage and assembly purposes.

3,863,794

VACUUM RETAINING JAR

Hideaki Hata, Tokyo, Japan, assignor to Brighton Corporation Ltd., Tokyo, Japan

Filed Apr. 11, 1973, Ser. No. 350,099
Int. Cl. A47j *41/02*
U.S. Cl. 215—13 **5 Claims**



1. A vacuum retaining jar comprising:

a. a thermoplastic outer shell;

b. a thermoplastic inner shell positioned therewithin to provide a space between the facing surfaces of the shells, said shells being of generally U-shaped cross-sectional configuration with open upper ends;

c. an annular metal ring provided on the outer surface of the inner shell and on the inner surface of the outer shell respectively at the upper ends thereof, said metal rings being partially embedded within the respective shell surfaces so that their outer faces are substantially flush with the shell surfaces;

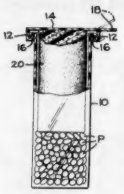
d. the facing surfaces of the shells and rings being coated with a metallic insulating layer; and

e. said rings having flange means, said flange means being secured together to seal the upper ends of the shells and the space therebetween.

3,863,795
SAFETY CONTAINER

Richard L. Mills, 2961 Westgate Ave., San Jose, Calif. 95125

Filed May 3, 1972, Ser. No. 249,951
Int. Cl. B65d 55/02; A61j 1/00
U.S. Cl. 215—201 3 Claims



1. A safety container for pills or the like which comprises, a receptacle having an open top,

a removable cap for the open top of said receptacle,

a compressible member adapted to substantially fill said receptacle and maintained in resilient engagement with the receptacle contents by application of said cap to said receptacle,

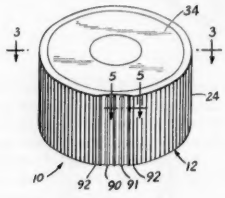
means forming an upturned flange on said cap, and

means forming a downturned flange on said receptacle dimensioned to provide interlocking connection with the upturned flange on said cap whereby said compressible member resiliently holds said cap and receptacle in interlocked connection.

3,863,796
SAFETY CLOSURE

Gerald L. Roy, Lancaster, Pa., assignor to Kerr Glass Manufacturing Corporation, Los Angeles, Calif.

Filed June 27, 1973, Ser. No. 374,273
Int. Cl. B65d 55/02, 85/56; A61j 1/00
U.S. Cl. 215—220 6 Claims

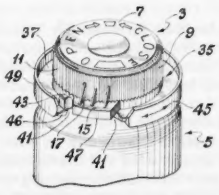


1. A closure for fastening to containers, comprising: an outer cap having a circular top end wall and a cylindrically shaped skirt depending from the outer edge of said top end wall, an inner cap having a top end wall and a depending skirt joined to the outer edge of said end wall, said outer cap overlying said inner cap and being concentric therewith, container fastening means on the skirt of the inner cap for releasably fastening on a portion of a container, radially extending teeth on the upper surface of the top end wall of the inner cap, radially extending teeth on the inner surface of the top end wall of the outer cap, vertically disposed ratchet teeth on the inner wall of said outer cap skirt, vertically disposed ratchet teeth on the outer wall of said inner cap skirt, said vertically disposed ratchet teeth on said respective caps abutting when the outer cap is turned in an application direction to rotate the two caps together and cause said container fastening means to fasten said inner cap onto said container, said ratchet teeth of said outer cap sliding over said vertically disposed ratchet teeth on said inner cap when said outer cap is turned in the removal direction, a central portion on said inner wall of said outer cap, a central portion on said inner cap engaging said central portion of said outer cap and spacing in a vertical direction said radially extending teeth of said caps from each other, a downward force on said outer cap engaging said radially extending teeth on said inner and outer caps so that a simultaneously applied torque on the outer cap in the removal direction will act through said radially and horizontally extending teeth to turn said inner cap to release the same from the container, said skirt of said outer cap having reduced cross-sectional thickness portions adjacent said ratchet teeth on the outer cap for flexing outwardly with ratcheting of said ratchet teeth on said outer cap past the ratchet teeth on said inner cap to reduce the friction and torque therebetween to assure that said inner cap remains stationary, the outer surface of said portions having at least two spaced apart vertically disposed ribs integrally formed therein and presenting a generally continuous outer circular working face upon which closure applying apparatus can contact during application of the closure to the container.

3,863,797
SAFETY CLOSURE-BOTTLE ASSEMBLY

Walter G. Berghahn, Scotch Plains, N.J., assignor to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 218,885, Jan. 19, 1972, Pat. No. 3,757,979. This application Nov. 20, 1972, Ser. No. 306,955
Int. Cl. B65d 55/02, 85/56; A61j 1/00
U.S. Cl. 215—225 6 Claims



1. A safety closure-bottle assembly comprising a flexible snap-on closure having a bottle engaging portion which is substantially circular in cross-section, said snap-on closure being of relatively low profile with respect to the outer diameter of said snap-on closure; said closure having a roof, a skirt and a lower marginal surface having an internal diameter of substantially uniform size, said skirt being provided on the internal surface thereof with means for engaging a bead on the neck of said bottle, said snap-on closure being provided with a tab extending outwardly from said lower marginal surface and having a lower surface which is in substantially the same place as the lower marginal surface of said closure; said skirs being tapered downwardly and outwardly from said closure roof to the outer circumference of said lower marginal surface, the shortness of said skirt and its taper being such as to make it difficult for a child to get its teeth on it when the closure is in position on a bottle; said bottle having a closure receiving portion which is also substantially circular in cross-section, said bottle being provided with a flange extending outwardly from said bottle in the region adjacent its closure receiving portion, said flange having a horizontally extending flat top surface adapted to flushly engage said lower marginal surface of said snap-on closure and further being provided with a first notch; said snap-on closure being capable of being snapped over the open end of said bottle irrespective of the relative circumferential position of said tab with respect to said flange, the relative radial dimensions of the various portions of the assembly and the relative dimensions of said tab and first notch being such that said closure is engageable from below for removal substantially only when it is positioned so that said tab is above said first notch when the assembly is in its upright position.

3,863,798

PUSH-BUTTON-TYPE CAP FOR CONTAINER

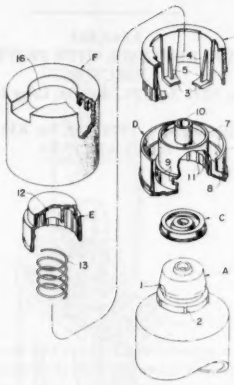
Tsuneaki Kurihara, Tokyo, and Kenji Saka, Odawara, both of Japan, assignors to Kanebo Kabushiki Kaisha and Yoshida Kogyo Kaisha Kabushiki, both of Tokyo, Japan

Filed Oct. 31, 1973, Ser. No. 411,406

Claims priority, application Japan, Nov. 6, 1972, 47-127232[U]; May 7, 1973, 48-52636[U]; May 7, 1973, 48-52637[U]

Int. Cl. B65d *41/02*

U.S. Cl. 215—301 14 Claims



1. A push-button-type cap for a container such as a bottle, comprising in combination:

an engaging cap member having an outer wall with a recess formed at its lower end and having an elastic engaging means positioned proximal to said outer wall and normally engaged with a receiving means formed around a mouth portion of said container,

an inner cap member having an inner member and an outer wall spaced from said inner member and connected to said inner member at their lower ends by a coupling member to provide an open-top hollow gap in which is received said engaging means of the engaging cap member, the upper portion of said outer wall of the inner cap member being fit in said recess of the engaging cap member, said inner member being fit to and covering said mouth portion of the container and provided with apertures for the passage therethrough of said engaging means,

a top-closed hollow push-button member with a circumferential wall slidably inserted between said inner member of said inner cap member and said engaging means of said engaging cap member for progressively engaging said elastic engaging means as this button member is depressed progressively to outwardly urge said engaging means to release said engaging means from engagement with said receiving means through said apertures, and

a container-mouth blocking means interposed between said mouth portion of the container and said inner cap member for blocking the dispensing open mouth of said container.

3,863,799

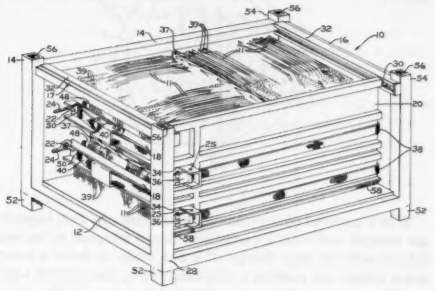
ADJUSTABLE BIN FOR TRANSPORTING ARTICLES

Ronald J. Thomaswick, Kittanning, and James R. Rowley, Freeport, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 20, 1973, Ser. No. 371,911

Int. Cl. B65d *57/00*

U.S. Cl. 220—1.5 7 Claims



1. In an adjustable bin for transporting or shipping articles wherein the bin comprises a back wall, a first side wall and a second side wall mounted to a base, the improvement comprises:

at least one rigid member mounted at the second side wall for movement toward and away from the first side wall; a door pivotally and slideably mounted between the first and second side walls for movement toward and away from the back wall;

means for adjusting said at least one rigid member in spaced relationship to the first wall to reduce or increase the length of the bin; and

means for adjusting said door in spaced relationship to the back wall to reduce or increase the width of the bin.

3,863,800

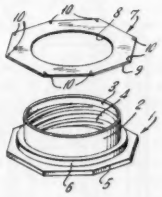
CONTAINER CLOSURE CONSTRUCTION

John Jesevich, Cicero, and Vyto Simkus, Chicago, both of Ill., assignors to American Flange & Manufacturing Co., Inc., New York, N.Y.

Division of Ser. No. 131,258, April 5, 1971, Pat. No. 3,800,401. This application Oct. 25, 1973, Ser. No. 409,389

Int. Cl. B65d *41/04*

U.S. Cl. 220—214 4 Claims

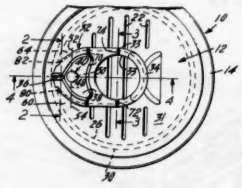


1. A closure container wall combination comprising a closure flange having an upstanding cylindrical neck surrounded by a circumferentially enlarged polygonal base, a container wall overlying said flange base and formed with an opening surrounding said flange neck, an annular tag ring element having an upstanding neck surrounding said flange neck and formed with a circumferentially enlarged polygonal base overlying said container wall, said polygonal flange base and said polygonal tag ring element base being aligned corner for corner and means formed in said tag ring element base for affixing a wire strand thereto.

3,863,801
FULL-OPEN END WITH CAMBERED TAB

Burton Frank Pillnik, Cary, Ill., assignor to American Can Company, Greenwich, Conn.

Filed July 27, 1973, Ser. No. 383,186
Int. Cl. B65d *17/20*
U.S. Cl. 220—267 **8 Claims**

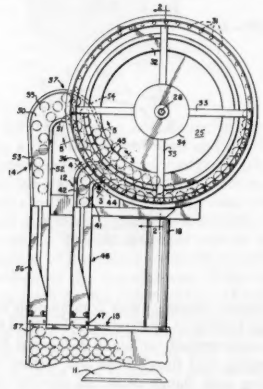


1. In a can end closure having a substantially flat, imperforate central wall with a peripheral flange adapted to be interfolded with an edge flange of a can body to form a double seam whose top portion is disposed above the central wall, a peripheral score defining a removable panel in the central wall, and an opening tab having a nose portion at the outer end adjacent the peripheral score and a handle portion at the inner end thereof, said tab being secured to the removable panel by a securement adjacent the nose portion, the improvement which comprises a camber and stress in the tab extending from at least about the securement to about the handle portion and a corresponding raised area of stress in the panel disposed beneath the cambered area of the tab, whereby when the end closure is placed on a can and the closed can is subjected to internal pressure, the tab handle portion will not rise above the top portion of the double seam.

3,863,802
CAP FEEDING HOPPER

Ben G. Daniels, Elmhurst, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Continuation of Ser. No. 114,835, Feb. 12, 1971, abandoned.
This application May 11, 1973, Ser. No. 359,517
Int. Cl. B65h *3/16*
U.S. Cl. 221—68 **17 Claims**

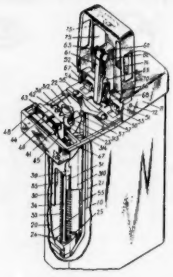


1. An apparatus for handling closure caps which are of magnetic material, said apparatus comprising a cylindrical hopper, a cap lifting disc in said hopper which is mounted for rotation about an axis coinciding with the axis of the hopper and in a plane inclined to the horizontal, said disc having magnets mounted in row formation about the marginal edge thereof for holding on the uppermost face lines of caps so as to advance the caps to plural discharge areas, the first discharge area being located within 60° above the bottom of the path traversed by said row of magnets, an inclined cap receiving chute having an upper entry end disposed adjacent the periphery of said cap lifting disc at a first discharge area and means at said first discharge area to wipe off an outermost line of caps advancing on the cap lifting disc and to feed the caps into said chute and a second inclined cap receiving chute having an upper entry end disposed adjacent the periphery of said cap lifting disc at a discharge area spaced downstream of the upper end of said first cap receiving chute at a point less than 90° from said first discharge area, and means at said second discharge area to wipe off caps advancing on the marginal edge of the cap lifting disc and to feed the caps into said second cap receiving chute.

3,863,803
CIGARETTE DISPENSER WITH SWIVEL ACTING EJECTOR

Albino Valcic, 3232 34th St., Astoria, Long Island City, N.Y. 11106

Filed Jan. 16, 1974, Ser. No. 433,910
Int. Cl. A24f *15/06*
U.S. Cl. 221—210 **11 Claims**



1. An article dispenser comprising a base member in an initial position surrounding at least a portion of said articles, a cover member covering said articles, a catcher positioned within said base member, first means for releasing said cover member from said initial position for exposing an opening into said base member and moving said catcher into lateral engagement with one of said articles, second means responsive to release of said cover for sliding said catcher and said article engaged therewith upwardly along said base member until said article projects through said opening, and third means responsive to the closing of said cover for resetting said catcher in its initial position within said base member.

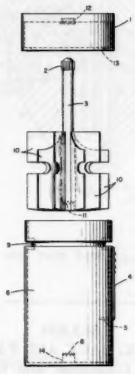
3,863,804
MEDICAMENT-DISPENSING CONTAINER

Francisco Infante-Diaz, Suite 304, Villa Olimpica, Edificio 12; Jose Rene Perez De La Parra, Valle Dorado, Barcelona 168; Luis Gaona-Ortiz, Llama 1, Ampliacion Vista Hermosa, and Aurea Gutierrez-Castaneda, Llama 19, Ampliacion Vista Hermosa, both of Tlalnepantla, all of Mexico

Filed Jan. 24, 1974, Ser. No. 436,093
Claims priority, application Mexico, Aug. 7, 1973, 145383
Int. Cl. B65h *3/00*
U.S. Cl. 221—251 **6 Claims**

1. A container for dispensing capsules in an individual manner comprising a generally cylindrical cap having an annular lip on the lower edge thereof and a small cylindrical cavity centrally positioned on the upper inner face thereof which presents in its periphery a series of grooves; a rotary

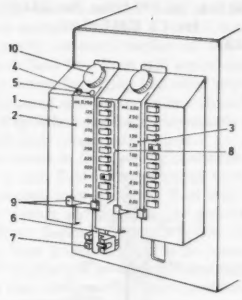
member having a stem on which upper portion thereof is provided a series of grooves on which lower portion thereof is provided a plurality of radially spaced walls and on which lower end thereof is defined a cylindrical cavity cavity that terminates interiorly in a plurality of teeth; and a generally cylindrical body having an open end, a peripheral groove near said open end, a small cylindrical projection centered on its inner lower face with the projection terminating in a plurality of teeth, a channel on its vertical outer face in which is inserted a small gate that runs to and from an opening in the



vertical wall to cover and uncover said opening, a substantially flat projection horizontally disposed and positioned intermediate the ends of the cylindrical body on its vertical interior face, said grooved upper portion of the stem engaging the cylindrical cavity of the cap, said cylindrical cavity of the rotary member being engaged by the cylindrical projection of the cylindrical body, said annular lip of said cap being inserted within the peripheral groove of the cylindrical body, said walls defining a horizontal cut in the outer edge of each to avoid being hindered by the projection of the inside face of the cylindrical body during rotation of the rotary body.

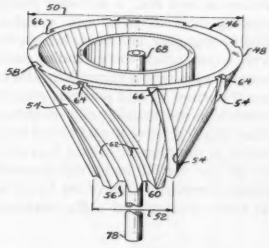
3,863,805
EXCHANGEABLE PISTON PUMP UNIT
Heinz Dzaack, Enebyberg, and Sven Axlid, Spanga, both of Sweden, assignors to LKB–Produkter AB, Bromma, Sweden
Filed June 6, 1973, Ser. No. 367,491
Claims priority, application Sweden, June 9, 1972, 7579/72
Int. Cl. B67d *5/30*
U.S. Cl. 222—14 **6 Claims**

1. Liquid dispensing system comprising a plurality of exchangeable liquid pump units and mounting means for removably supporting any one of said pump units in a position for dispensing liquid in measured quantities, each of said pump units including a housing containing movable piston means having an exteriorly projecting means for moving the piston means, said mounting means including a plurality of setting means arranged in spaced relationship to each other and in proximity to a support pump unit, said mounting means also being provided with driving means for engagement with the means for moving the piston means of a pump unit in predetermined increments in response to actuation of a setting means, the amount of said increment of movement being dependent upon the respective setting means actuated, each of the housings of the pump units being provided with volumetric indicia means arranged in spaced relationship to each other and to be disposed respectively in proximity to respective ones of said setting means, the predetermined increment of movement of a piston means initiated by actuation of each setting means being the respective amount necessary to dis-



pense the volume of liquid denoted by the indicia means disposed in proximity to that setting means.

3,863,806
TURBINE METER
Ross Eugene Risser, Jr., Bonham, Tex.
Filed Oct. 9, 1973, Ser. No. 404,237
Int. Cl. B67d *5/38*
U.S. Cl. 222—23 **10 Claims**



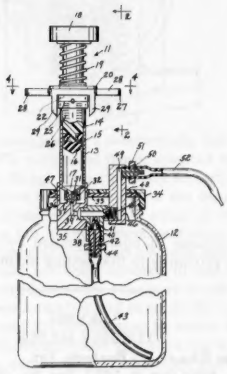
1. In fuel dispensing equipment including storage means for confinement of a supply of fuel, hose and nozzle means for discharging said fuel into a receptacle, pump means connected to the storage means for forcing said fuel under pressure to said nozzle means, and fuel register means; fuel meter means connected between said pump and nozzle means and operable to actuate said fuel register means comprising: a housing having an inlet receiving fuel from said pump means and an outlet discharging fuel to said nozzle means; a turbine rotor mounted on a shaft journaled in said housing, a seat formed in said housing, said rotor having a configuration shaped to cooperate with said seat of said housing, said rotor having a plurality of tapered spiral grooves formed in a peripheral surface thereof; and electrical means disposed adjacent said rotor for counting and sending to said register means the number of revolutions of the rotor; said fuel in being pumped through the grooves of the meter means being effective to raise the rotor from the seat of the housing, revolve said rotor therein and thereby measure the volume of fuel dispensed from said nozzle.

3,863,807

LIQUID DISPENSING AND TRANSFER DEVICE

Justin Joel Shapiro, Berkeley, and John W. G. Chin, Richmond, both of Calif., assignors to said Shapiro, Berkeley, Calif., by said Chin

Filed Feb. 20, 1974, Ser. No. 444,176
Int. Cl. G01f *11/06*
U.S. Cl. 222—43 **7 Claims**



7. A liquid dispensing device comprising a barrel having fluid conduit means at one end, a movable plunger in said barrel and extending from its other end, a collar member surrounding, slidably engaging, and being longitudinally movable on said barrel, a connection rod extending parallel to and adjacent said barrel, means rigidly connecting said connection rod to the external portion of said plunger, means to rigidly connect said connection rod to said collar member, whereby said collar member moves relative to said barrel in accordance with the positioning of the plunger in said barrel, and finger-gripping means on the barrel including depending guard flange means adjacent opposite sides of the barrel and spaced therefrom to at times receive said collar member therebetween.

3,863,808

PARTICULATE MATERIAL CONVEYING APPARATUS

Charles R. Vertue, Etobicoke, Ontario, Canada, assignor to Volstatic of Canada Limited, Ontario, Canada

Filed Mar. 20, 1974, Ser. No. 453,119
Claims priority, application Canada, Jan. 16, 1974, 190309
Int. Cl. B65g *53/14;* **B67b** *7/24*
U.S. Cl. 222—82 **12 Claims**

1. Particulate material conveying apparatus, comprising:

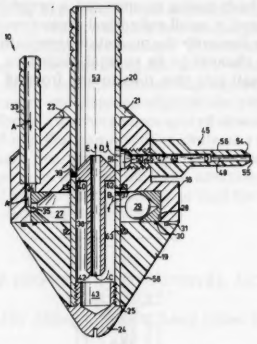
an inlet for the entry of particulate material into the apparatus;

a gas flow passage extending past said inlet;

means for vibrating said inlet comprising a ball race extending around and spaced outwardly from said gas flow passage and a ball adapted to be driven around said race; and

a compressed gas supply passage communicating with said vibrator means for supplying compressed gas to said vibrator means to drive the ball around the race;

said vibrator means having a compressed gas outlet communicating with said gas flow passage for discharging the compressed gas from said vibrator means along said gas flow passage past said inlet to thereby entrain the particulate material through said inlet into and along said gas flow passage.

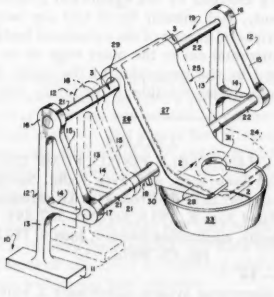


3,863,809

DISPENSING RACK AND PACKAGE

William C. Christine, Catasaque, and William E. R. Watt, Barto, both of Pa., assignors to Inpaco, Allentown, Pa.

Filed July 2, 1973, Ser. No. 375,364
Int. Cl. B65d *33/14*
U.S. Cl. 222—105 **2 Claims**

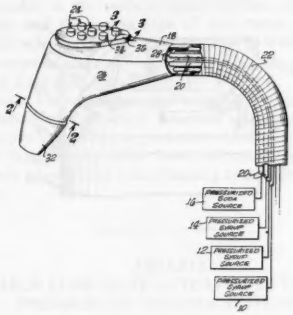


1. An apparatus for dispensing pourable materials comprising, a rack including spaced parallel similar side members each embodying a horizontally disposed base portion, up standing legs, horizontally disposed extensions and inclined portions connecting said up standing legs and horizontal extensions, upper and lower telescoping cross pieces connecting said side members together, securing elements connected to said cross pieces, a holder embodying an inclined back piece having a slotted portion receiving the upper cross piece and a horizontally extending bottom section having a slotted portion adjacent thereto for receiving the lower cross piece, a key way in the bottom portion of said holder, a flexible pouch having a quantity of material therein to be dispensed, a fitment on said pouch received in said key way, and a dispensing valve for selectively engaging said fitment.

3,863,810
PLURAL SOURCES BEVERAGE DISPENSING APPARATUS

Sigurd A. Hanson, Los Angeles, Calif., assignor to Bar Mates Fluidic Systems, Inc., Los Angeles, Calif.

Filed Oct. 9, 1973, Ser. No. 404,307
Int. Cl. B67d 5/56
U.S. Cl. 222—129.1 4 Claims

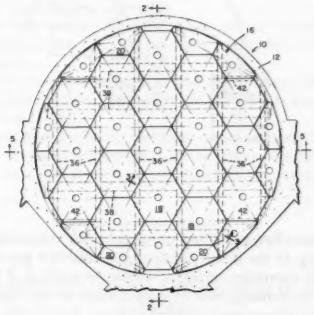


1. A soft drink dispensing system comprising:
a plurality of sources of syrup each maintained at a relatively low pressure;
a source of soda maintained at a relatively high pressure;
a hand-holdable, fully mechanical valve control means having a plurality of fluid inlets and a fluid dispensing head at a fluid outlet thereof; and
conduit means connecting said plurality of syrup sources and said soda source to different inlets of said valve control means; and
said valve control means including
a housing,
a plurality of normally closed valves in said housing one for each different syrup source and each including
a valve cavity extending from an outer surface of said housing,
a valve spindle in said cavity with an upper end portion exposed beyond said outer surface,
upper, intermediate and lower spools on said valve spindle,
a first inlet port into a side of said cavity immediately below said lower spool,
a second inlet port into a side of said cavity immediately above a top of said intermediate spool and below said upper spool,
a first outlet port from a side of said cavity above said first inlet port and below said intermediate spool,
a second outlet port from a side of said cavity below said second inlet port,
a first seal on an inner wall of said cavity between said first inlet and outlet ports slidably engaging an outer surface of said lower spool to block fluid flow between said first inlet and outlet ports when said valve is in its normally closed position and releasing from said lower spool as said spindle is moved axially into said cavity to define an open position for said valve,
a second seal on an inner wall of said cavity between said first and second outlet ports slidably engaging an outer surface of said intermediate spool to block fluid flow between said second inlet and outlet ports and said first outlet port,
a third seal on an inner wall of said cavity between said second inlet and outlet ports slidably engaging an outer surface of said intermediate spool to block fluid flow between said second inlet and outlet ports when said valve is in said closed position and releasing from said intermediate spool as said valve is moved to said open position,
a fourth seal on an inner wall of said cavity between said second inlet and a top of said cavity slidably engaging an outer surface of said upper spool to block fluid flow from said top of said cavity, and
spring means for urging said valve spindle away from a bottom of said cavity to said closed valve position, said spindle being finger depressible in said cavity to said open valve position, and
conduit means in said housing connecting said first inlet port to said fluid inlet connected to said soda source, said second inlet port to a fluid inlet connected to a syrup source and said first and second outlet ports to said fluid dispensing head, whereby soda at said relatively high pressure acts on the lower spool of each valve to produce an upward force rapidly moving the valve from said open to closed positions upon a release of its associated valve spindle and an initial upward movement thereof in response to its associated spring means.

3,863,811
LAMINAR FLOW BIN

Glen W. Fisher, Bellevue, and Fred A. Franz, Mercer Island, both of Wash., assignors to Technovators, Inc., Seattle, Wash.

Continuation of Ser. No. 145,648, May 21, 1971, abandoned.
This application May 10, 1973, Ser. No. 358,866
Int. Cl. B67d 5/60
U.S. Cl. 222—145 17 Claims



7. A laminar flow bin for solid particulate material which comprises:
A. a vertical peripheral wall defining a storage volume consisting of substantially all of the particulate material storage space within the bin; and
B. hopper discharge means at the lower end of the storage volume for effecting discharge of particulate material from the storage volume under laminar flow conditions throughout substantially the entire length of the storage volume, said hopper discharge means including:

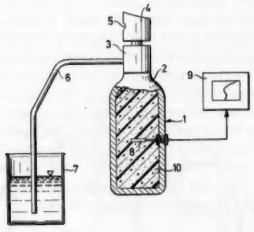
1. a plurality of substantially identical, open-topped hoppers arranged in side-by-side adjacency, each said hopper including an upper inlet, a lower outlet smaller than and in axial alignment with said upper inlet on the same vertical axis, and an inner surface inclining downwardly from said upper inlet to said lower outlet at a slope of at least 55°, said upper inlets occupying the entire central cross sectional area and occupying in toto substantially the entire cross-sectional area enclosed by said vertical peripheral wall; and
2. flow control means regulating particulate material discharge from said hoppers for effecting particulate material discharge simultaneously from each hopper at a rate proportional to the relative cross-sectional area of each such hopper.

3,863,812
Patent Not Issued For This Number

3,863,813
LIQUEFIED-GAS CARTRIDGE WITH DISPENSING VALVE

Helmut Metzner, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 22, 1974, Ser. No. 462,693
Claims priority, application Switzerland, Apr. 25, 1973, 5883/73; Jan. 31, 1974, 1333/74
Int. Cl. B67d *5/62*
U.S. Cl. 222—146 HA **13 Claims**



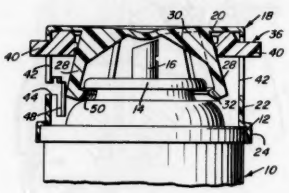
1. A liquefied-gas filled cartridge with dispensing valve, comprising, in the liquid phase of the liquefied gas contained within the cartridge, an agent which, on cooling of the liquefied gas in consequence of evaporation of the liquid phase whilst the valve remains open, releases heat to the liquefied gas.

3,863,814
SAFETY CAP FOR AEROSOL CANS

Jewel J. Shelton, 5208-F Falls of Neuse Rd., Raleigh, N.C. 27609

Filed Nov. 1, 1973, Ser. No. 411,770
Int. Cl. B67d *5/32*
U.S. Cl. 222—153 **9 Claims**

1. For use in conjunction with an aerosol can incorporating a valve surrounding outwardly projecting bead, a cap and associated locking ring, said cap including a top, a plurality of sections depending from said top and terminating in inturned lower ends engageable beneath the valve surrounding bead of an aerosol can, said sections encircling said bead, said sections being outwardly flexible in a manner so as to outwardly move said inturned ends upon a compression of the cap top inward

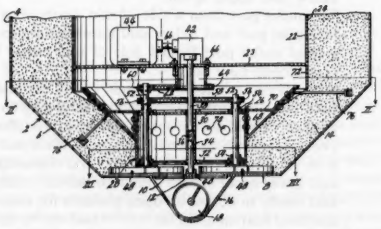


of said sections, a ring surrounding said sections and being vertically positionable between a first position surrounding and closely engaging the inturned end portions of said sections and a second position vertically upward therefrom, said ring, in the first position, precluding an outward flexing of said sections, said ring, in said second position, allowing an outward flexing of said sections.

3,863,815
GRAIN METERING DEVICE

Robert C. Chaffee, Green, and Delmar Toburen, Riley, both of Kans., assignors to Gilmore-Tatge Manufacturing Co., Inc., Clay Center, Kans.

Filed Mar. 7, 1974, Ser. No. 448,833
Int. Cl. G01f *11/20*
U.S. Cl. 222—238 **10 Claims**



1. In combination with a grain receptacle having a grain discharge opening in the floor thereof, a metering device for

regulating the rate of discharge of grain through said opening, said metering device comprising:

a. a meter housing disposed within said receptacle in spaced relation above said discharge opening, concentrically with and of greater horizontal dimensions than said opening, whereby grain must pass beneath said housing to reach said opening,

b. power means operable to rotate said meter housing about a vertical axis concentric with said discharge opening,

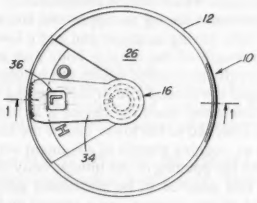
c. at least one scoop wheel carried rotatably by said meter housing on a vertical axis eccentric to the axis of said housing, said wheel including radially extending fingers operable in the vertical space between said receptacle floor and the lower edge of said meter housing, said fingers being of sufficient length to extend radially outwardly of said meter housing, and radially inwardly over said discharge opening, and

d. means whereby rotation of said meter housing results in rotation of said scoop wheel in an opposite direction relative to said housing rotation whereupon the fingers of the latter scoop grain from said receptacle under the lower edge of said meter housing to said discharge opening.

3,863,816
VARIABLE FLOW RATE ACTUATOR BUTTON FOR A PRESSURIZED AEROSOL DISPENSER

John Richard Focht, Yonkers, N.Y., assignor to Precision Valve Corporation, Yonkers, N.Y.

Filed Nov. 1, 1972, Ser. No. 302,784
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.17 **5 Claims**



1. A variable flow rate actuator for a pressurized aerosol dispenser comprising:

a body and a plug having a cylindrical portion;

said body including a discharge orifice, means for connection to a dispenser valve and a cylindrical socket in communication with the connection means to receive said plug cylindrical portion;

said body including a groove extending longitudinally of the cylindrical wall of said socket;

said plug cylindrical portion being positioned in said socket to overlie the body socket groove, said plug being rotatable relative to said body;

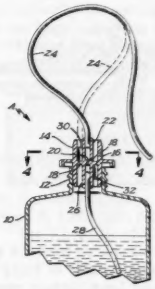
a plurality of circumferentially spaced grooves of different cross-sectional areas extending longitudinally of the sidewall of said plug cylindrical portion to the bottom end of said plug portion, the plug grooves being selectively registerable with said body socket groove upon rotation of said plug, said plug portion grooves being in direct communication with said dispenser valve;

said discharge orifice being in communication with said body socket groovd.

3,863,817
CONTAINER WITH APPLICATOR TUBE FOR DISPENSING A LIQUID FOR DETECTION OF LEAKS

Guy Speaker, 4240 Fairview Ave., Minnetonka, Minn. 55343

Continuation of Ser. No. 241,198, Apr. 6, 1972, abandoned. This application Aug. 6, 1973, Ser. No. 385,820
Int. Cl. B67d *5/06*
U.S. Cl. 222—530 **2 Claims**



1. A container with applicator tubes for dispensing a liquid, comprising in combination:

a. a deformable bottle having,

b. a hollow neck,

c. a stopper having first and second identical ends, each of said first and second ends being snuggly insertable into said hollow neck,

d. said stopper having a first socket formed in said first end and

e. a second socket, identical to said first socket, formed in said second end of said stopper, said first and second sockets terminating in an,

f. inner wall having a,

g. flow hole axially of said first and second sockets and of a diameter less than the diameter of said first and second sockets,

h. a tube mounted in each of said first and second sockets in communication with said flow hole and in contact with said inner wall,

i. said stopper including identical storage sockets formed in said first and second ends for receiving the free end of said first and second tubes to seal off the same.

3,863,818
DISPENSING CLOSURES WITH INTEGRAL SPOUT LATCHES

Robert E. Hazard, No. Kingston, R.I., assignor to Polytop Corporation, Slatersville, R.I.

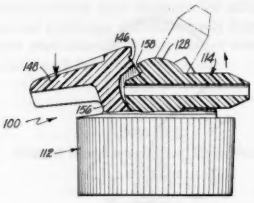
Filed Dec. 17, 1973, Ser. No. 425,227
Int. Cl. B67b *7/12*
U.S. Cl. 222—531 **7 Claims**

1. In a dispensing closure having a cap and a spout, said cap being adapted to be attached to a container and having an opening leading therethrough, said spout having a passage extending therethrough and being capable of being rotatably mounted on said cap so as to be capable of being rotated between a closed position in which said spout closes off said opening and an opened position in which said passage is aligned with said opening, the improvement which comprises: said cap having latch means formed integrally therewith,

said cap and said latch means being formed of a resilient material,

said latch means including a resilient wall means which extends from the top of said cap and a lever means and a latch surface means both of which are carried by the extremity of said wall means remote from the top of said cap,

said latch surface means overlying a part of said spout when said spout is in said closed position so as to lock said spout against rotation from said closed position,



said lever means being spaced from the top of said cap and said wall so as to be capable of being manually engaged so as to rotate said latch surface means to a sufficient extent so that said spout may be rotated to said opened position,

said latch means being sufficiently resilient so that when said spout is rotated from said opened position to said closed position said latch surface means automatically engages said spout so as to hold said spout in said closed position.

3,863,819

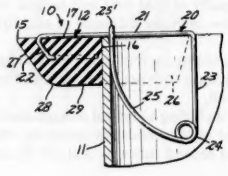
POURING SPOUT ATTACHMENT

John G. Storm, 5210 Villa Way, Minneapolis, Minn. 55424

Filed Dec. 1, 1972, Ser. No. 311,128

Int. Cl. B65d *25/48*

U.S. Cl. 222—569 **2 Claims**



1. A pouring spout attachment for open top containers comprising:

a. a flexible resilient body having converging side edge portions, the juncture of which forms a vertex, and having a base edge portion connecting said side edge portions;

b. said side edge portions and base edge portions cooperating to define a planar upper surface;

c. said base edge portion having a curved surface which is generally normal to said upper surface, said curved formed on a radius that is less than that of containers on which it is to be mounted; and

d. a mounting clamp carried by said body for resiliently engaging the inner surface of the container upon which the spout attachment is secured at a single point, said mounting clamp including:

i. a mounting element having a first leg portion secured to said body and extending along said upper surface from a point adjacent said vertex and bisecting base edge portion to form a capillary flow path;

ii. a second leg portion depending from said first leg portion, spaced from said base edge portion;

iii. a clamping arm carried by said second leg portion and movable toward and away from said base edge portion to engage a container which may be inserted between said base edge portion and said clamping arm; and

iv. said clamping arm is guided in said movement toward and away from said vase portion by said first leg portion.

3,863,820

POUR SPOUT

Franklin Eugene Wharton, 1308 Sartori Ave., Torrance, Calif. 90501

Filed Nov. 8, 1973, Ser. No. 413,888

U.S. Cl. 222—569 **8 Claims**

1. A pour spout device adapted to be positioned over an opening in the end wall of a container having at least one end wall and a side wall, the opening having two ends, a first end adjacent the juncture of the end wall and the side wall, and a second end spaced inwardly from the juncture of the end wall and the side wall, which device comprises:

a. a tubular body having an upper end and a lower end;

b. a vent tube having an upper end and a lower end extending the length of the tubular body and attached to and eccentrically positioned within the tubular body so as to be toward the second end of the opening in the end wall of the container when the device is in use;

c. a plate attached to the lower end of the tubular body and having an opening therein in alignment with and coextensive with the opening of the tubular body, the plate having a first end adapted to be positioned generally over the first end of the opening and a second end adapted to be positioned generally over the second end of the opening;

d. a pad of resilient material attached to the surface of the plate opposite the tubular body and having an opening therein in alignment with and coextensive with the opening of the tubular body, the pad being adapted to sealingly engage the surface of the end wall of the container around the opening therein;

e. a hook shaped lever arm swinging out from a first end positioned below the pad of resilient material and then upwardly to a second end at a position spaced from the plate and below the plane of the plate;

f. means comprising a collar extending downwardly from the plate and within which the first end of the lever arm is mounted attaching the first end of the lever arm to the plate towards the second end thereof so that the lever arm may be slid through the opening, the second end of the lever arm being positioned below and bearing against the end wall so as to compress the pad into sealing position when the plane of the plate is parallel to the plane of the end wall;

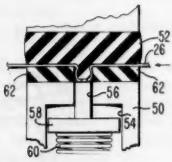
g. means for compressing the pad below the first end of the plate into sealing position on the end wall of the container to complete the seal.

3,863,821

BURSTING, SEPARATING AND/OR DIE CUTTING APPARATUS FOR CONTINUOUS FORMS

Hans Lochmann Van Bennekom, Rochester, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 2, 1973, Ser. No. 356,515
Int. Cl. B26f *3/02*; B65h *35/10*
U.S. Cl. 225—93 8 Claims



1. Apparatus for separating continuous multiple item forms into separate and individual items comprising;

oppositely disposed, relatively rigid members,

one of said rigid members being movable with respect to the other of said rigid members,

means of differing relative resilience disposed on each of said rigid members, the upper resilient means being solid, flat faced, flexible material, the lower resilient means being formed as two separate, flat faced members with a cavity therebetween, the resilient means of one member being receivable within the cavity formed by the resilient means of the other of said rigid members,

means for advancing continuous item forms between said rigid members, and

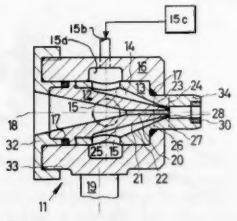
means operably associated with said advancing means and said rigid members whereby relative movement between said rigid members causes said resilient means to grip said items and force the resilient means of one of said rigid members into the cavity of the other of said resilient means so that the items therebetween are burst apart along a line of preweakening between items.

3,863,822

NOZZLE DEVICE FOR PRODUCING A FLUID JET

Rachid Keldany, Zurich, Switzerland, assignor to Ruti Machinery Works Ltd., (formerly Caspar Honegger), Ruti/ZH, Switzerland

Filed May 1, 1973, Ser. No. 356,103
Claims priority, application Switzerland, May 29, 1972, 7895/72
Int. Cl. B65h *17/32*
U.S. Cl. 226—97 8 Claims



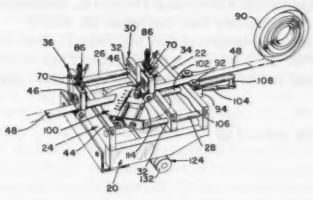
1. Nozzle device for producing a jet of fluid for inserting weft threads into a shed on a loom, the said nozzle device comprising an inner portion and an outer portion symmetrically surrounding said inner portion, said inner and outer portions defining a ring shaped nozzle aperture for a jet of fluid to flow out, there being defined between the said inner portion and the said outer portion a chamber which contains the weft thread propelling fluid, said outer portion being formed with a plurality of apertures for supplying the fluid to said chamber from a fluid source, said chamber having a front and a rear zone with its front zone extending rearwardly away from said nozzle aperture and forming an "aiming" portion for determining the direction of the flow of said jet of fluid, and which is prolonged by said rear zone forming a storage portion, the apertures for supplying the fluid to said chamber being located in said rear zone remote from the nozzle aperture, said aiming portion being elongated and delimited by two walls at least one of which is conical and that converge with respect to each other to produce a substantially uniform decrease in the cross-section of the aiming portion in the direction of the nozzle aperture, a bore in said inner portion for passage of said weft thread to be propelled by said jet of fluid passing from said nozzle aperture, and a means for supplying said fluid flow to said chamber.

3,863,823

STRIP STOCK FEEDING MECHANISM

Arthur L. Allred, High Point, N.C., assignor to Allred Metal Stamping Works, High Point, N.C.

Filed Sept. 4, 1973, Ser. No. 393,731
Int. Cl. B65h *17/36*
U.S. Cl. 226—142 9 Claims



1. Apparatus for feeding a continuous strip of material to a punch press comprising, a base, reciprocable means supported upon said base, means upon said reciprocable means for gripping and intermittently advancing said strip of material uniformly and accurately, means for preventing retrogressive movement of the strip material advanced by said gripping means, rotatable driven means mounted upon said base, drive means, including a clutch, selectively coupling said rotatable means with a press drive, adjustment means supported upon said rotatable means for selectively varying the stroke of said reciprocating means and the length of strip material fed, and means positively and directly coupling said adjustment means to said reciprocable means.

3,863,824

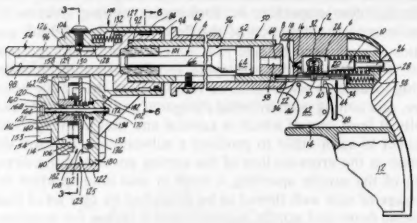
AUTOMATIC FASTENER FEED MAGAZINE AND FEED BELT

Andrew G. Bakoledis, Clinton, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 23, 1973, Ser. No. 408,341
Int. Cl. B25c *1/14*
U.S. Cl. 227—10 10 Claims

1. An automatic fastener feed mechanism for a power-actuated tool of the type including a muzzle bushing having an opening for receiving a fastener to be driven, said mechanism comprising a magazine housing having an upper portion supported by the muzzle bushing and a lower portion having a cylindrical side wall, a cam track in said side wall, a follower mounted for movement in said cam track between a first loading position and a second position adjacent said opening in the muzzle bushing, a cover member having a side wall spaced from said side wall of said lower portion to provide a

space for receiving a plurality of fasteners, means biasing said follower toward said opening in said muzzle bushing, and



means for rotating said follower against the bias of said biasing means.

3,863,825

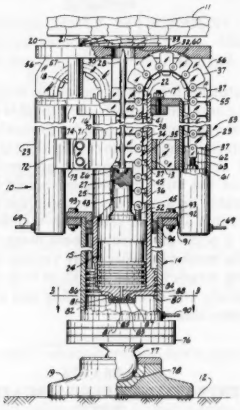
MACHINE FOR DRIVING MINE ROOF PINS HAVING COAXIAL JACKING MEANS

Gerald W. Elders, P.O. Box 1369, Aspen, Colo. 81611; Thomas R. Alongi, 350 E. Main St., DuQuoin, Ill. 62832; Thomas E. Schneider, deceased, late of 601 E. Park St., DuQuoin, Ill. 62832, and Thomas R. Schneider, administrator, 527 Mallory Ln., DuQuoin, Ill. 62832

Continuation-in-part of Ser. No. 202,611, Nov. 26, 1971, Pat. No. 3,819,101 which is a division of Ser. No. 846,795, Aug. 1, 1969, abandoned. This application Jan. 4, 1974, Ser. No. 430,639

Int. Cl. B27f *7/02*

U.S. Cl. 227—130 **12 Claims**



1. In a machine for driving mine roof pins:

a. an elongate pin cylinder,

b. a pin piston movably received in the pin cylinder, the pin piston providing a seat for a mine roof pin,

c. a pressure plate carried by and movable with the pin cylinder,

d. a base supported by the mine floor, and

e. jacking means supported by the base and urging the pin cylinder and the pressure plate toward the mine roof, said jacking means including a jack piston member and a jack cylinder member coaxial with the pin cylinder, said jack piston member being integral with said pin cylinder for movement with said pin cylinder and said jack cylinder member being movable relative to said pin cylinder.

3,863,826

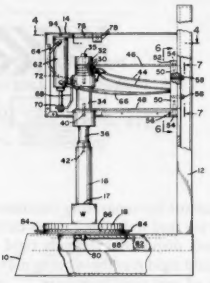
SONIC OR ULTRASONIC APPARATUS

Andrew Shoh, Ridgefield, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.

Filed Apr. 23, 1973, Ser. No. 353,227

Int. Cl. B23k *1/06, 5/20*

U.S. Cl. 228—1 **23 Claims**



1. A sonic or ultrasonic apparatus comprising:

a support for supporting electroacoustic transducer means;

electroacoustic transducer means adapted to be resonant at a predetermined frequency of sound for providing vibratory energy in response to electrical energy of said frequency applied;

leaf spring means coupling said transducer means to said support, said spring means being dimensioned to yield in the direction substantially parallel to the axis of propagation of the vibratory energy provided by said transducer means, but to exhibit rigidity in a direction substantially normal to said axis, and

motive means coupled to said transducer means for imparting gross reciprocating motion to said transducer means relative to said support in a direction substantially parallel to said axis for coupling said transducer means into vibratory energy transmitting contact with a workpiece and for withdrawing said transducer means from such energy transmitting contact.

3,863,827

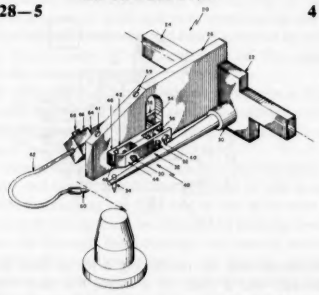
TAILLESS WIRE BONDER

Richard F. Foulke, Carlisle, and James E. Kelly, Melrose, both of Mass., assignors to Mech-El Industries, Inc., Woburn, Mass.

Filed Nov. 10, 1972, Ser. No. 305,568

Int. Cl. B23k *37/04*

U.S. Cl. 228—5 **4 Claims**



1. In apparatus adapted to form a tailless bond between fine electrical conductive wire and electrical contact points of semiconductor devices the combination of:

a. a mounting block;

b. a tool holder rigidly mounted on said block extending outward therefrom;
c. a capillary bonding tool on said tool holder, said bonding tool having a longitudinal axis, said bonding tool further having a capillary opening for receiving said conductive wire, said opening disposed coincident with said longitudinal axis of said tool;
d. a source of bonding energy for driving said bonding tool to form a bond between said conductive wire and said electrical contact point;
e. an assembly arm mounted on said block extending outward therefrom;
f. a lever arm pivotally mounted on said assembly arm;
g. a conductive wire clamp comprising a pair of jaws mounted on said lever arm, said jaws positioned and arranged to grasp said conductive wire at a selected distance from said bonding tool substantially along said bounding tool longitudinal axis;
h. means for actuating said clamp jaws to grasp said conductive wire;
i. means for moving said lever arm and said clamp a selected distance substantially along said axis toward said bonding tool by pivoting said lever arm and said clamp while said bonding tool remains stationary to form a bow in said conductive wire;
j. means for simultaneously raising said tool holder and said assembly arm away from said bond sufficient to break said conductive wire at said bond whereby a tailless bond is formed and whereby a predetermined length of conductive wire is left extending below said bonding tool substantially equal in length to said bow,
k. means for altering the end of said extending conductive wire to form an enlarged portion of a predetermined uniform size and shape in preparation for a future bonding sequence.

3,863,828

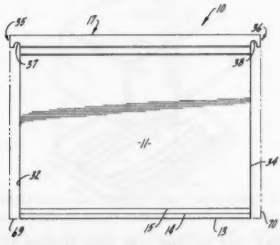
SELF LAMINATED HANGING FILE FOLDER

Jack C. King, North Muskegon, Mich., assignor to The Shaw-Walker Company, Muskegon, Mich.

Continuation of Ser. No. 154,458, June 18, 1971, abandoned. This application July 9, 1973, Ser. No. 377,586

Int. Cl. B65d *1/00*

U.S. Cl. 229—1.5 R **3 Claims**



1. A hanging file folder including:
a front panel and a rear panel formed integrally from a piece of paper and connected about a bottom fold,
a hanger member formed integrally at the upper end of each panel and including a plurality of plies of said panel folded one upon the other and adhered to one another,
each hanger member including an upper portion and a lower portion with the upper portion having hooks formed at the opposite ends thereof and located laterally outwardly of the sides of the panels,
the lower portion of each hanger member being offset relative to the upper portion to strengthen said hanger member,
said hook members extending toward said bottom fold but terminating short of the lower portion of said hanger member.

3,863,829

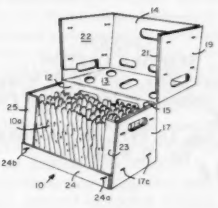
SHIPPING AND DISPLAY CONTAINER FOR FRESH PRODUCTS SUCH AS ASPARAGUS

Thomas M. Merrill, P.O. Box 659, Salinas, Calif. 93901

Filed June 7, 1973, Ser. No. 367,836

Int. Cl. B65d *5/00, 5/22*

U.S. Cl. 229—16 D **3 Claims**



1. A combined shipping and display container for fresh products such as asparagus, the combination comprising a box body having a bottom, a rear wall and double thickness side walls, one thickness of said side walls having the rear edges thereof integral with the respective sides of said rear wall, the other thickness of said side walls having the bottom edges thereof integral with the sides of said bottom, a cover having a top, a front wall and double thickness side members, the rear edge of said top being hingedly attached to the top edge of said rear wall, said front wall being attached to the front edge of said top, one thickness of said side members being attached to the side edges of said top and the other thickness of said side members being attached to said front wall, said side members overlapping said side walls when said top is lowered to close said box body and said front wall closes the front of said box body, and means attaching said front wall to said bottom and to said end walls when said box body is closed.

3,863,830

LIQUID AND GAS SEALING CARDBOARD PACKAGE

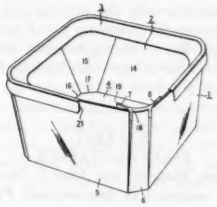
Od Wikar Christensson, Bromma, Sweden, assignor to Christenssons Maskiner & Patenter AB, Bromma, Sweden

Filed June 12, 1972, Ser. No. 261,957

Claims priority, application Sweden, June 30, 1971, 8424/71

Int. Cl. B65d *5/58*

U.S. Cl. 229—14 BA **4 Claims**



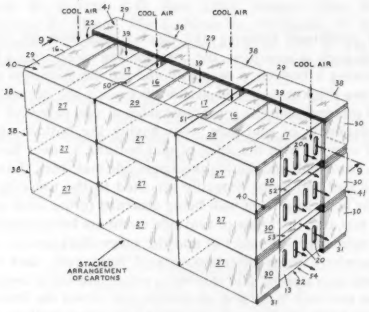
1. A liquid and gas sealing package comprising an outer package of cardboard or any other fairly stiff material and an inner package of a thin sealing material which completely covers the interior of the outer package, and a sealing lid which sealingly receives the upper edge both of the outer package and the inner package in a downwards open groove

thereof, both said outer package and said inner package being formed of continuous blanks each including a bottom, side pieces and corner pieces, said corner pieces being comprised of a corner panel and a fold part on each side of said corner panel and resting against the inside of the adjacent side piece, the fold part of the outer package being received within the corresponding fold of the inner package and at least each fold part of the outer package being formed with somewhat less height than its side pieces and corresponding corner and side pieces of the inner package so that the upper part of the outer package along its whole upper edge will be formed by the inner package and only one layer of cardboard at the maximum.

3,863,831
SHIPPING CARTON

Roger M. Wozniacki, Brea, and Wilbur Wong, Long Beach, both of Calif., assignors to International Paper Company, New York, N.Y.

Filed Aug. 15, 1972, Ser. No. 280,881
Int. Cl. B65d *13/04*
U.S. Cl. 229—23 R **24 Claims**



1. A carton open at its top for loading comprising a central body section open at its top having a bottom panel and two side wall panels attached to opposed edges of the bottom panel; end wall panels at each end of the body section having attached thereto four extension panels; a first extension panel joined to the outer surface of the bottom panel in face-to-face relationship therewith, second and third extension panels joined to the outer surfaces of the two side wall panels in face-to-face relationship therewith; the first extension panel disposed beneath the bottom edges of the second and third extension panels with the second and third extension panels resting on the first extension panel; a movable fourth extension panel adapted to overlie the top edges of the second and third extension panels; the extension panels joined to the body section at each end thereof having between them an apertured zone in the body section occupying about 33 to 75 percent of the surface area of the body section.

3,863,832
FOOD CONTAINER

Robert L. Gordon, Monroe, and John C. Siegele, New City, both of N.Y., assignors to International Paper Company, New York, N.Y.

Filed Dec. 20, 1972, Ser. No. 316,664
Int. Cl. B65d *5/20*
U.S. Cl. 229—30 **14 Claims**

1. A container for packaging, storing and heating foods which comprises:

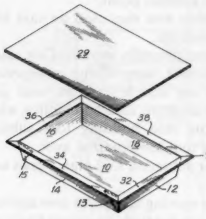
a. a paperboard tray, the interior surface of which is coated with a thermoplastic, said tray including,

i. a base portion

ii. a plurality of upstanding walls foldably connected to said base portion,

iii. a plurality of corner closures, each corner closure foldably connected to a respective one of said upstanding walls and overlapping bonded thereto,

iv. horizontally disposed panels each foldably connected to the top of a respective one of said upstanding walls,



the end of said panels abutting each other to form a peripheral flange,

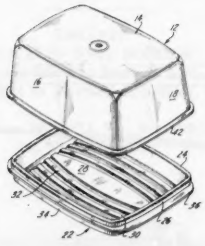
b. a lid disposed on said flange, the interior surface of said lid coated with a thermoplastic; and

c. a heat sensitive adhesive connection between said lid and said flange wherein said heat sensitive adhesive connection is adapted to fail when the pressure within said container reaches a predetermined value whereby said lid is automatically seperated from said tray.

3,863,833
STORAGE CONTAINER FOR MEAT OR POULTRY PRODUCTS

James B. Swett, Barrington, R.I., and Robert H. C. M. Daenen, Erembodegem, Belgium, assignors to Dart Industries Inc., Los Angeles, Calif.

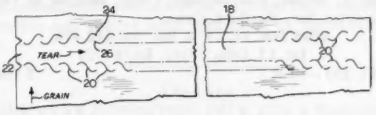
Continuation of Ser. No. 194,885, Nov. 2, 1971, abandoned. This application Aug. 13, 1973, Ser. No. 387,646
Int. Cl. B65d *5/64, 43/00*
U.S. Cl. 229—43 **4 Claims**



1. A storage and serving tray and closure combination adapted to hold consumable foodstuffs and the like comprising: a tray member having a recessed bottom wall integral with an upwardly extending side wall, said bottom wall being integrally constructed to include a plurality of raised rib areas adapted to support the foodstuff so that the remaining channel-like portion thereof will collect any fluids exuded thereby, the upper portion of said side wall having a cross-section in the shape of an inverted U with the top surface characterized by an outwardly extending ledge with a downwardly projecting sealing surface that terminates in a laterally extending annular lip all of which are integral with said side and bottom walls, and a closure having a top wall and side walls, said side walls including a sealing flange area that is adapted to sealably engage said sealing surface and which area is further sup-

ported by an outwardly protruding peripheral rim that is positioned above the lower edge of said sealing flange area such that it is approximately opposite the outwardly extending ledge of said tray when said closure is in sealing relation thereon.

3,863,834
TEAR-STRIP FOR PAPERBOARD CONTAINER
Peter E. Sandford, London, Ontario, Canada, assignor to Somerville Industries Limited, London, Ontario, Canada
Filed Oct. 9, 1973, Ser. No. 404,292
Int. Cl. B65d *5/54*
U.S. Cl. 229—51 TS **12 Claims**

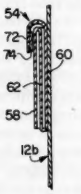


1. A paperboard container having a tear-strip in a panel thereof, said tear-strip having its side edges each defined by a series of cuts,

the terminal end of each cut being in advance of the initial end of the next following cut in the direction of tear of said tear-strip,

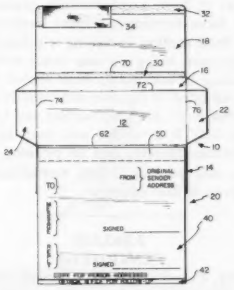
the terminal end portion of each cut being inclined in a direction that intersects the next following cut a substantial distance from its initial end whereby pulling force on the strip in the direction of tear is applied substantially to tear initiation at the terminal ends of said cuts in succession.

3,863,835
LETTER PACKAGES
Wilfred H. Gendron, Wilbraham, Mass., assignor to United States Envelope Company, Springfield, Mass.
Filed Sept. 18, 1972, Ser. No. 289,773
Int. Cl. B65d *27/10, 27/04, 27/06*
U.S. Cl. 229—69 **16 Claims**



1. A continuous form letter package assembly comprising an elongated web of sheet material defining at least one longitudinal series of foldable carrier envelope-letterhead blanks connected together in series in end-to-end relation and a plurality of reply envelope structures equal in number to said carrier envelope-letterhead blanks, each of said letter packages comprising one of said blanks and an associated one of said reply envelope structures carried by said one blank, said one blank having a copy area on the front surface thereof and including two carrier envelope panels connected along a common fold line, one of said carrier envelope panels having a window opening therethrough spaced from said common fold line, said one blank having means for securing said two carrier envelope panels in folded relation with said associated one reply envelope structure therebetween when said one blank is separated from said series and said one carrier envelope panel is folded along said common fold line relative to the other carrier envelope panel to form a carrier envelope for said one reply envelope structure, said one reply envelope structure comprising a reply envelope, a coupon panel connected to said reply envelope, and a pair of attaching tabs connected to said coupon panel for attaching said one reply envelope structure to said one blank, said reply envelope having a plurality of body panels connected together to form an envelope body, said coupon panel being connected to the upper edge of one of said body panels along an associated line of weakening and folded downwardly therealong and into overlying relation with said envelope body, said attaching tabs being connected along associated lines of weakening to the respective opposite side edges of said coupon panel and extending outwardly in opposite directions therefrom and beyond the respectively associated side edges of said envelope body, each of said attaching tabs being adhesively connected to an associated portion of the front surface of said other carrier envelope panel, said coupon panel and said tabs cooperating with said other carrier envelope panel to retain said envelope body between said other carrier envelope panel and said coupon panel and in generally overlying relation with an associated portion of said front surface of said other carrier envelope panel, said coupon panel having an address area thereon in registry with and exposed in said window opening when said two carrier envelope panels are secured in folded relation by said securing means.

3,863,836
TWO-WAY ENVELOPE AND LETTER
William H. Austin, 186 S. Main St., Cheshire, Conn. 06410
Filed Dec. 29, 1972, Ser. No. 319,762
Int. Cl. B65d *27/06*
U.S. Cl. 229—73 **5 Claims**



3. A combination two-way envelope and letter comprising envelope means formed by a single foldable sheet, said sheet having a front surface and a rear surface;

said sheet being divided into a central panel portion, a top panel portion and a bottom panel portion connected respectively to the top and bottom of said central panel portion, a pair of side flap portions connected respectively to the sides of said central panel portion, and a cover flap portion connected to said top flap portion;

adhesive means on said sheet front surface including a first adhesive portion on said top panel portion adjacent its juncture with said cover flap portion and a second adhesive portion at the outer edge of said cover flap portion; and

message means formed by a multiple sheet set including means for transmitting a message written on the top sheet of said set onto the remaining sheets in said set;

said message means being attached to the front surface of said bottom panel portion;

said message means including means enabling individual sheets from said set to be separated and removed from

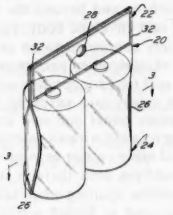
said set, while the remaining sheets in said set remain attached to said bottom panel portion.

3,863,837

CARDLESS HEAD BOARD MERCHANDISING PACKAGE

Jacob Spiegel, Philadelphia, Pa., and Albert Miller, Somerdale, N.J., assignors to Gilbreth Company, Philadelphia, Pa., by said Miller

Filed Aug. 17, 1972, Ser. No. 281,600
Int. Cl. B65d *65/04*
U.S. Cl. 229—87 R **2 Claims**



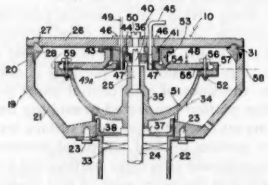
1. A package for displaying and packaging articles, said package being suspendable from a rod, said package comprising a sheet of heat shrinkable film which will retain its dimensional stability when subjected to prolonged ambient temperatures up to 120° F, said sheet being formed with a loop section for receiving said articles and a head section, said sheet being folded upon itself whereby the lower portion comprises the loop section and the upper portions comprise the head section, with the abutting faces of said head section being heat sealed together to form a substantially planar head section, said abutting faces forming an inner surface on said head section, said head section including a printed portion, with said printed portion being on said inner surface, said head section consisting of said planar heat sealed faces, said loop section being adapted to receive and contain said articles by placing said articles in said loop section and heating said loop section above 120° F to shrink said loop section to tightly secure said articles therein, and an opening formed in said head section, said package being suspendable from a rod which is received in said opening.

3,863,838

CENTRIFUGE

Frank E. Pronk, Calgary, Alberta, Canada, assignor to R. M. Hardy Associates Ltd., Calgary, Alberta, Canada

Filed Aug. 8, 1973, Ser. No. 386,770
Int. Cl. B04b
U.S. Cl. 233—2 **4 Claims**



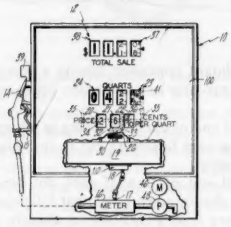
1. A centrifuge assembly comprising in combination a vertically situated body portion, a drive shaft extending upwardly into said body portion from the base thereof, means to support said drive shaft for rotation within the said base of said body portion, a centrifuge bowl having an upper side bounded by a peripherial rim, detachably engaged for rotation over said drive shaft and within said body portion, a centrally apertured detachable cover for said bowl in clamping engagement with said rim, a filtering medium operatively clamped between said detachable cover and said rim of said bowl, a detachable cover for said body portion, an upper drive shaft steady bearing assembly secured to said cover for said body portion, bearably engaging over the upper end of said drive shaft, and an annular vertically situated U-shaped sediment trap formed around the periphery of said bowl and extending substantially above the horizontal plane of said rim of said bowl.

3,863,839

FUEL PUMP COMPUTER CONVERSION TO QUARTS/LITERS PRICING AND COST COMPUTATION

Bradley L. Batson, Marlborough, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Filed Feb. 14, 1974, Ser. No. 442,476
Int. Cl. G06c *15/42*; **B67d** *5/22*
U.S. Cl. 235—94 R **5 Claims**



1. Conversion means for expanding the price range of a mechanical fuel pump computer having a variator driven by a fuel meter in accordance with the volume amount of fuel delivered and settable for independently establishing each place of a gallon unit volume fuel price within a three place price range and having at least one set of three number wheels for posting the three places respectively of the gallon unit volume price established by the variator setting; and a resettable register having at least one volume counter connected to be driven by the meter to provide a gallons readout of the amount of fuel delivered and resettable to zero between fuel deliveries and at least one cost counter connected to be driven by the meter and via the variator in accordance with the variator setting to provide a dollars readout of the cost amount of fuel delivered in accordance with the gallons readout and the gallon unit volume price established by the variator setting; each of said counters comprising a counter shaft, a transfer pinion shaft extending parallel to the counter shaft, a plurality of counter wheels of ascending order mounted on the counter shaft each having an outer rim with one decimal set of angularly spaced count indicia, adjacent counter wheels of relatively higher and lower order each having a disengageable wheel reset gear for resetting the counter wheel to zero, a disengageable wheel drive gear for rotating the counter wheel for counting, and gear engagement means operable by the counter shaft by axially shifting the counter shaft in one direction for disengaging the wheel drive gear and engaging the wheel reset gear for conditioning the counter wheel for being reset and by axially shifting the counter shaft in the opposite direction for engaging the wheel drive gear and conditioning the counter wheel for counting, the adjacent lower order counter wheel having a combination locking ring and single two-tooth segment transfer gear, and a plurality of transfer pinions mounted on the transfer pinion shaft each mounted in engagement with a wheel drive gear and combination locking ring and single two-tooth transfer gear of adjacent counter wheels of relatively higher and lower order for generating a one count transfer from the lower to the higher order counter wheel for every revolution of the lower order wheel; the conversion means comprising a substitute lowest order counter wheel for each counter; each substitute counter wheel having

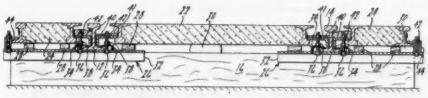
a said disengageable wheel drive gear, a said disengageable wheel reset gear, a said gear engagement means operable by the counter shaft, an outer rim bearing four decimal sets of angularly spaced count indicia, and a combination locking ring and transfer gear with four equi-angularly spaced two-tooth transfer gear segments and intermediate locking ring portions for generating a one count transfer from the substitute lowest order counter wheel to the next order counter wheel for every one-fourth revolution of the substitute counter wheel; whereby a fuel pump computer converted by the conversion means is operative to set and post a quart/liter unit volume price with its variator, provide a quarts/liters volume readout of the volume amount of fuel delivered, and provide a dollars readout of the cost amount of fuel delivered in accordance with the quarts/liters volume delivered and the quart/liter unit volume price established by the variator setting.

3,863,840

VEHICULAR SUPPORTING DECK FOR A RAILROAD GRADE CROSSING

Paul J. Szarka, and Joseph R. Szarka, both of Livonia, Mich., assignors to Szarka Enterprises, Inc., Livonia, Mich.

Filed Mar. 5, 1973, Ser. No. 338,047
Int. Cl. E01b *2/00*
U.S. Cl. 238—8 **10 Claims**



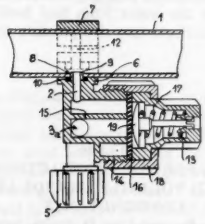
1. In a railroad grade crossing including a pair of running rails carried by a plurality of supporting ties, a crossing structure embodying a unit slab member spanning the area between said rails, bridging means between said running rails and the edges of said member adjacent to said rails for securing said edges thereto, and flowable means for supporting said member from said plurality of ties after said means has been deformed by said member and hardened.

3,863,841

LIQUID SPRAYING DEVICE

Fernand Berthoud, Rhone, France, assignor to Berthoud S.A., Belleville sur Saone, Rhone, France

Filed May 7, 1973, Ser. No. 358,057
Claims priority, application France, May 8, 1972, 72.17718
Int. Cl. B05b *1/30*
U.S. Cl. 239—266 **5 Claims**



1. A liquid spraying device to be connected to a pressurized liquid supply line, comprising:

a. a body including

a liquid receiving portion having an inner passage to receive the pressurized liquid to be sprayed;

means to connect said inner passage with the pressurized liquid supply line;

a transverse branch extending substantially on each side of said liquid receiving portion, said branch being formed with a longitudinal bore which does not communicate directly with said inner passage, and said longitudinal bore having two open ends;

tubular nozzle carrying portions extending substantially radially from said transverse branch on each side of said liquid receiving portion and communicating with said longitudinal bore;

and an antidrip-valve carrying portion laterally disposed with respect to said liquid receiving portion, said lateral portion having a substantially flat surface and being formed with ducts respectively communicating with said inner passage and with said transverse bore, with each of said ducts having an open end terminating at said substantially flat surface;

b. an antidrip diaphragm valve bearing against said flat surface to close the open ends of said ducts in the absence of the liquid under pressure within at least one of said ducts;

c. resilient means to press said diaphragm valve against said flat surface;

d. spraying nozzles mounted on said nozzle carrying portions;

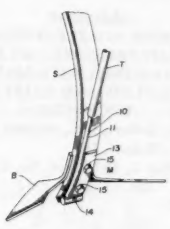
e. and valve means slidably mounted in each end of said longitudinal bore and selectively operable to block the flow of liquid from said bore to at least one of said nozzle carrying portions.

3,863,842

FERTILIZER APPLICATOR

Raymond J. McFarland, Box 36, and David L. McFarland, Box 54, both of Gwinner, N. Dak. 58044

Filed Apr. 11, 1974, Ser. No. 460,117
Int. Cl. B05b *1/06*
U.S. Cl. 239—283 **5 Claims**



1. A fertilizer applicator comprising:

a tubular elongated stem having a longitudinal passage;

a tubular manifold extending transversely to the elongated stem, having a longitudinal passage therein in communication with the longitudinal passage of the elongated stem, and a countersunk aperture extending transversely through the tubular wall of the manifold from the passage therein to the exterior thereof;

a mounting plate secured to the elongated stem and the tubular manifold.

3,863,843

ANTI-BACK SIPHONING WATER SUPPLY VALVE AND MIXER

Valentine Hechler, IV, 26 Meadow View Rd., Northfield, Ill. 60093

Continuation of Ser. No. 333,309, Feb. 16, 1973, abandoned. This application Apr. 15, 1974, Ser. No. 460,889
Int. Cl. B05b *7/30*
U.S. Cl. 239—318 **17 Claims**

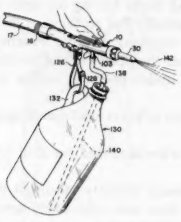
1. In a safety device for potable water supply and dispensing system having a manually valved outlet;

a housing defining a flow compartment connected releasably to the outlet and having an inlet port, an outlet

dispensing means having a flow area open to atmosphere substantially less than the flow area of the compartment, a valve port opening to atmosphere disposed intermediate the inlet port and the outlet dispensing means, and mixing means between said valve port and outlet dispensing means;

an inlet valve closing the inlet port against the inflow of potable water to the inlet port;

a vent valve in communication with said valve port opening to vent the compartment to atmospheric pressure;



means for coordinating said valves to open one while closing the other; and

resilient means under pressure coacting with the coordinating means to activate said inlet valve to close said inlet port when the opening force of supply water upon the inlet valve and the closing forces of water pressure in said compartment upon the vent valve drops to a predetermined positive gauge pressure.

3,863,844

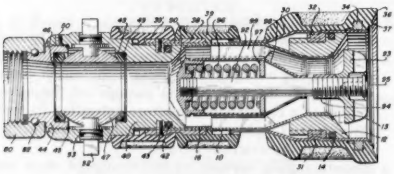
AUTOMATIC FIRE NOZZLE WITH AUTOMATIC CONTROL OF PRESSURE AND INTERNAL TURBULENCE COMBINED WITH MANUAL CONTROL OF VARIABLE FLOW AND SHAPE OF STREAM PRODUCED

Clyde H. McMillan, Hobart, Ind., assignor to Fire Task Force Innovations, Inc., Hobart, Ind.

Filed May 2, 1973, Ser. No. 356,567

Int. Cl. B05b *1/32*

U.S. Cl. 239—452 **17 Claims**



1. A nozzle body for regulated discharging of a fluid with an automatic pressure controlling mechanism axially and reciprocably mounted therein, and said pressure controlling mechanism having a piston head constructed and positioned in the path of fluid flow and cooperating with a surrounding portion of the nozzle body to form a variable size first annular opening for the passage of fluid, and said pressure controlling mechanism also having a control baffle cooperating with a surrounding conical portion of the nozzle body to form a variable size second annular opening for the discharge of fluid, wherein said control baffle is mounted on a shaft is adapted to be manually positioned in relation to an adjacent conical surface for purposes of flushing or manually overriding of automatic pressure control.

3,863,845

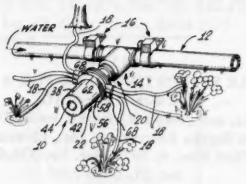
EMITTER FOR LOW RATE, LOW PRESSURE DISCHARGE OF IRRIGATING WATER

John G. Bumpstead, Glendora, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.

Filed Mar. 18, 1974, Ser. No. 451,852

Int. Cl. B05b *15/00, 1/14*

U.S. Cl. 239—542 **15 Claims**



5. An emitter for distributing water at a low rate and low pressure uniformly to a plurality of selected areas from a single source of water of relatively high pressure, said emitter comprising:

a body portion coupled to the source and receiving water under relatively high pressure;

means defining a helical path having inlet and outlet ends in said body portion and through which water from said source spirals to substantially reduce its pressure;

an annular chamber in said body and receiving water from said outlet end of said helical path;

a pluraltiy of elongated flexible tubes communicating with said annular chamber; and

means for dissipating the spiral motion of the water leaving said helical path preparatory to discharge through said tubes, whereby said tubes each receive a substantially uniform amount of low pressure water from said chamber and distribute the water from said body portion at a substantially uniform rate and pressure through each of said tubes.

3,863,846

APPLICATION FOR THE BENEFACTION OF COAL UTILIZING HIGH VOLATILE LIQUIDS AS CHEMICAL COMMINUTANTS

Douglas V. Keller, Jr., and Clay D. Smith, both of Lafayette, N.Y., assignors to Chemical Comminutions International, Inc., Lafayette, N.Y.

Filed Aug. 22, 1972, Ser. No. 282,735

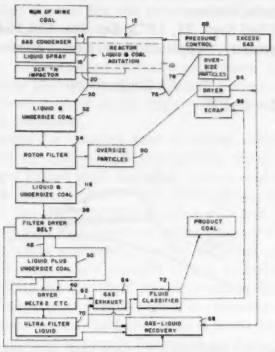
Int. Cl. B02c *19/00*

U.S. Cl. 241—1 **30 Claims**

1. Apparatus for comminuting coal comprising:

a reactor containing coal essentially submerged in a liquid chemical comminutant for producing reactants, such as impurity materials and product coal, the reactor including (1) means to provide a small variational mechanical

stress on the coal by the comminutant, and (2) means to provide at least a partial separation of the impurity materials from the coal without generating environmental pollutants or physical hazards.

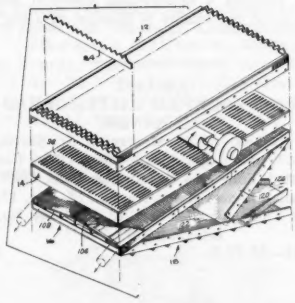


3,863,847

FOUNDRY SAND REDUCER AND RECLAIMER

Wallace Day, Augusta; Alvin E. Postell, Martinez, and William D. Postell, Augusta, all of Ga., assignors to Georgia Iron Works Co., Grovetown, Ga.

Filed July 26, 1973, Ser. No. 382,789
Int. Cl. B02c *19/20*
U.S. Cl. 241—14 **29 Claims**



1. The method of reducing into individual grains, large lumps of foundry sand formed from sand grains coated with organic material and foundry binders formed by chemical reaction in the mold and reclaiming the grains into reusable foundry sand without impact forces sufficiently severe to fracture the sand grains comprising:

vibrating said large lumps of foundry sand to produce agglomerates of sand grains and individual grains in a first zone, passing said sand grains to a second zone,

vibrating said grains in said second zone to maintain said grains substantially continually in an unsupported state, contacting substantially each of said grains with adjacent grains while in said unsupported state for at least 10 seconds to reduce the agglomerates to individual grains by cleaving said agglomerates along the interface of the binder, and

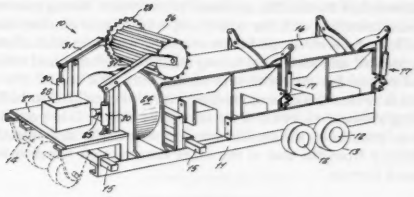
simultaneously abrading said grains with adjacent grains to remove a sufficient amount of binder coated on said grains to permit commercial foundry reuse, and thereafter collecting said individual sand grains.

3,863,848

GIANT TREE CHOPPER

David J. Mashuda, R.D. No. 1, Evans City, Pa. 16033

Filed Jan. 2, 1974, Ser. No. 430,192
Int. Cl. B02c *21/02*
U.S. Cl. 241—101.7 **5 Claims**



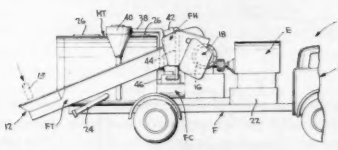
1. Mobile apparatus having a frame on which is carried a rotary cutter member for fragmentizing whole trees and tree trunks, wherein the improvement comprises a plurality of horizontal telescoping trough members for supporting the tree trunk longitudinally of said frame and in position to be fed endwise against said rotary cutter member, transversely spaced guide channels on said frame, and anti-friction rollers on said telescoping trough members cooperatively engaging in said channels whereby to movably support said trough members for movement longitudinally of said frame.

3,863,849

DUST ABATEMENT SYSTEM FOR MIXING APPARATUS

John L. Kugle, and Robert C. Futty, both of Lancaster, Pa., assignors to Irl Daffin Associates, Inc., Lancaster, Pa.

Filed Oct. 5, 1973, Ser. No. 403,886
Int. Cl. B02c *9/04*, *13/04*; **B07b** *4/00*
U.S. Cl. 241—152 A **6 Claims**



1. A mixing apparatus for materials such as livestock feed comprising, in combination, a mixing tank, means within said mixing tank for mixing fluent materials fed into said mixing tank, milling means for comminuting solid livestock feed materials into a fluent state prior to feeding same into said mixing tank, first conduit means communicating the outlet of said milling means with said mixing tank, feeding conveyor means for receiving solid livestock feed materials from a source of same, said feeding conveyor means having a discharge end remote from said source to which the solid livestock feed materials are conveyed, housing means overlying said discharge end of said feeding conveyor means and having an inlet and an outlet opening, shredding means operatively associated within said housing means between said inlet and outlet openings for preparing coarse solid livestock feed materials for said milling means, second conduit means communicating said outlet of said housing means with the inlet of said milling means, and a dust abatement means for removing fine particles of said livestock feed materials from said housing means to preclude escape thereof through said inlet opening of said housing means and for simultaneously removing such

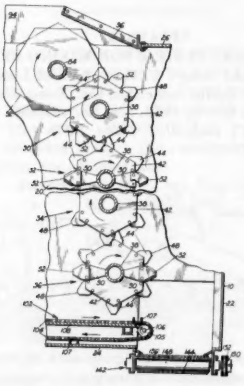
fine particles from said first conduit means and creating a negative pressure between the inlet and the outlet of said milling means, said dust abatement means delivering said fine particles to said mixing tank, said dust abatement means comprising fan means including an inlet end at which a negative pressure is produced and an outlet end at which a positive pressure is produced, a housing dust baffle secured over an opening in said housing means, and a conduit dust baffle secured over an opening in said first conduit means, said conduit dust baffle having spaced side walls, a first tube section having one end communicating with said housing dust baffle and a second end communicating with one side wall of said conduit dust baffle, a second tube section having one end communicating with the other side wall of said conduit dust baffle and a second end communicating with said inlet of said fan means, and additional tubing means connecting said outlet end of said fan means to said mixing tank, the end of one of said tube sections communicating with said conduit dust baffle being slidingly received in its associated side wall to permit it to be positioned within said conduit dust baffle at a selected distance from the end of the other tube section which is opposed thereto.

3,863,850

BALE SHREDDER AND DISCHARGER

Percy F. Freeman, 2034 N.W. 27th Ave., Portland, Oreg. 97210

Filed Feb. 25, 1974, Ser. No. 445,494
Int. Cl. A01f *29/00*
U.S. Cl. 241—186 R **7 Claims**



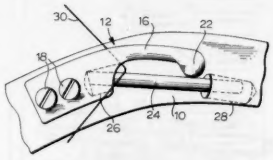
1. A device for shredding baled material comprising:
a. a bin for receiving bales to be shredded,
b. a plurality of power driven rotating knife assemblies in said bin disposed one above the other and each including a cross shaft and radially extending knife blades projecting therefrom,
c. conveyor means arranged to feed bales into said knife,
d. a power driven cross shaft above the uppermost shaft of the knife assemblies,
e. and a plurality of wheels on said last mentioned shaft,
f. said wheels projecting radially beyond the uppermost knife blades with relation to the side from which the bales are fed by said conveyor means,
g. said wheels being non-round so that their peripheral edges provide abutment for material which has worked up on the knife assemblies in a shredding operation whereby the material is held down for efficient shredding.

3,863,851

DEVICE FOR HOOKING A YARN ON A ROTATING SUPPORT

Rolland Sartori, Roanne, France, assignor to Rhone-Poulenc-Textile, Paris, France

Filed Sept. 25, 1973, Ser. No. 400,564
Claims priority, application France, Sept. 25, 1972, 72.34461
Int. Cl. B65h *65/00*
U.S. Cl. 242—18 PW **7 Claims**



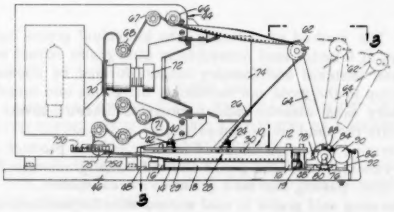
1. A device for hooking a moving yarn on rotatable support means comprising a rotatable mounting means, a hooking catch mounted on said mounting means in close proximity to an end of the support means and responsive to centrifugal force to hold the yarn during rotation of the rotatable mounting means and release the yarn when the rotatable mounting means ceases to rotate, said hooking catch including a finger element and an elongated elastic element adjacent to the finger element held with play at each of its ends, said finger element and said elastic element forming a yarn receiving recess therebetween such elastic element deforming when subjected to a centrifugal force and resuming its original form when the centrifugal force dissipates, said elastic element being adapted to compress said yarn between itself and said finger element during rotation of said mounting means and to release the yarn during deceleration of said mounting means, said finger carrying a substantially spherical polished tip adapted to catch the totality of filament of a multifilament yarn.

3,863,852

CONTINUOUS LOOP FILM CARTRIDGE AND DRIVE MECHANISM

Gerald F. Rackett, 13543 Moorepark St, Sherman Oaks, Calif. 91403, and Ralph Sacks, Hilton Office Center, 900 Wilshire Blvd., Suite 1134, Los Angeles, Calif. 90017

Continuation-in-part of Ser. No. 64,372, Aug. 17, 1970, abandoned. This application Mar. 13, 1972, Ser. No. 233,957
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.19 R **14 Claims**



1. A system for handling an endless strip of material such as motin picture film for use with a film projector or the like, whereby the strip of material is to be disposed in a single coil having one continuous external section for engagement with the projector, the combination comprising:
a housing, a turntable mounted within said housing, said turntable comprising a disc providing a flat continuous

surface, a hub member mounted upon said turntable, said hub extending upwardly from the surface of said turntable, an exit aperture in said housing near the center of said turntable, an entrance aperture in said housing near the edge thereof for the return of said external loop to said coil in said housing;

guide means mounted adjacent said housing, said guide means being spaced laterally and above said exit aperture, said guide means operative to guide said strip out of said housing at an acute angle with respect to the plane of said turntable;

drive means for rotating said turntable, said drive means comprising a continuously running motor, said motor having a motor shaft engaging said turntable;

control means coupled to said drive means, means responsive to the size of a loop formed in the strip of material between said exit aperture and a projector to which the strip extends, said responsive means being coupled to said control means, said control means including means for controlling the electrical signal to said motor for continuously varying the speed thereof in response to changes in said loop whereby said turntable is made to continuously rotate at varying speeds the minimum being greater than zero under normal operating conditions; and

a layer of material deposited upon the surface of said turntable, said layer having a low coefficient of friction, said housing having a top cover plate, a plurality of strip-like members affixed to the underside of said cover plate disposed in a substantially radial fashion with respect to said turntable, means for adjustably positioning said strip-like members in a spaced-apart relationship with respect to said turntable surface so as to be capable of frictionally engaging the edges of said coil of said endless strip material when said material is so disposed upon said turntable surface.

3,863,853

ENDLESS MAGNETIC TAPE CARTRIDGE

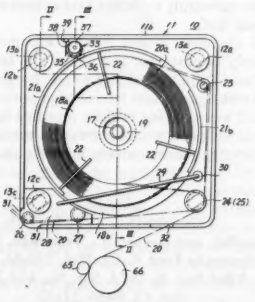
Hiroyuki Umeda, Yokohama, Japan, assignor to Victor Company of Japan, Ltd, Yokohama, Kanagawa-ken, Japan

Filed Apr. 4, 1972, Ser. No. 240,965

Claims priority, application Japan, Apr. 6, 1971, 46-24909[U]; Apr. 30, 1971, 46-33597[U]; May 7, 1971, 46-35758[U]; May 7, 1971, 46-35759[U]; May 7, 1971, 46-35760[U]; May 14, 1971, 46-38193[U]; May 14, 1971, 46-23818

Int. Cl. B65h *17/48*

U.S. Cl. 242—55.19 A **4 Claims**



1. An endless-tape cartridge for use in a recording and/or reproducing apparatus of the type wherein an endless tape is caused to travel obliquely with respect to the rotating plane of a rotary magnetic head for recording and/or reproducing video signals, said cartridge comprising: a cartridge casing; a spool rotatably accommodated within said casing; a body of wound tape of an endless-tape wound around said spool and disposed in the lower half part of the casing; a first guide member for guiding a tape portion drawn out of the innermost periphery of said body of wound tape to a high position higher than the position of the body of wound tape; a tape outlet provided in a side wall of the casing at a position of the same height as said high position such that said tape guided by said first guide member can move out of the casing at said high position; a tape inlet provided in a side wall of the casing at a position lower than said high position such that the tape which has moved out of said tape outlet can enter into the casing at the same high position as the body of wound tape; and a second guide member for guiding the tape which has thus entered through said tape inlet in such a manner that it is wound around the outermost periphery of the body of wound tape, said endless tape drawn out of the casing through the tape outlet being held between a capstan and a pinch roller of said recording and/or reproducing apparatus and thereby being driven and caused to travel, and said first guide member being disposed above and coaxially with said second guide member.

3,863,854

APPARATUS FOR SPLICING PAPER ROLLS

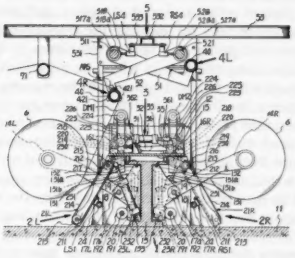
Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Co., Ltd., Osaka, Japan

Filed Nov. 30, 1972, Ser. No. 310,703

Claims priority, application Japan, Dec. 30, 1971, 47-2380; Feb. 15, 1972, 47-16254; Mar. 13, 1972, 47-25930

Int. Cl. B65h *19/12*

U.S. Cl. 242—58.2 **9 Claims**

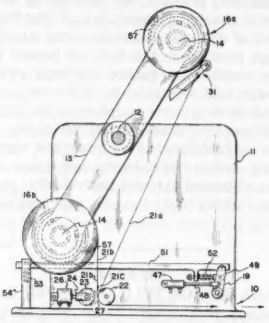


1. An apparatus for splicing a running web which is being continuously withdrawn from an expiring roll with a fresh fully wound web roll without interrupting the continuous operation thereof which comprises a mill stand, said fully wound roll and said expiring roll being rotatably supported by said mill stand in mutually opposed positions, means for rotating said fully wound roll and said expiring roll, respectively, guide roll means disposed in said mill stand between said fully wound roll and said expiring roll, cutting means supported in the mill stand and associated with said guide roll means for cutting the web running from the expiring roll after the splicing operation has been achieved, and an assembly of web shifting roller means disposed above said mill stand and above said web rolls, said assembly of web shifting roller means comprising a pair of opposing outer arms and a pair of opposing inner arms, each of said pairs of arms being rotatably mounted at their one end above said mill stand and each of said other ends of said pairs of arms being provided with a web pushing roller which is adapted to engage the running web being drawn from the expiring roll and means for independently displacing said pairs of arms containing said web pushing rollers and the web associated therewith from a position above the web rolls to the cutting means and into engaging relationship with the fully wound web roll whereby the leading end of the fresh web roll is spliced with the running web of the expiring roll.

3,863,855
FILM UNWINDING AND SPLICING APPARATUS AND METHOD

Rene J. Gaubert, 4219 Oakmore Rd., Oakland, Calif. 94602

Filed Oct. 20, 1972, Ser. No. 299,370
Int. Cl. B65h 19/16
U.S. Cl. 242—58.4 8 Claims



1. Apparatus for unwinding and splicing rolls of material, the exterior lead end of the material being provided with splicing adhesive, means for supporting separate first and second rolls of the material on spaced parallel horizontal axes, a horizontal rotatable take-off roller over which the material is entrained as it is unwound from the first one of the rolls, a rotatable presser roller disposed alongside and parallel to the take-off roller, means for moving the presser roller from a normal retracted position in spaced proximity to the take-off roller to a pressing position in which its peripheral surface is pressed against the take-off roller and the material entrained upon the same, there being a vertically open gap between the rollers when said presser roller is in its normal retracted position, the lead end of the material from the second roll of material and the gap between said take-off and presser rollers being such that such lead end hangs down by gravity with its lower end in proximity with the gap between the rollers, and means responsive to completion of the unwinding of material from the first roll to energize the means for moving the presser roller whereby the presser roller is moved against the take-off roller and the material entrained over the same, and means to effect lowering movement of said lead end of the material from the second roll downwardly between the take off and presser rollers whereby said lead end is caused to be pressed against and to adhere to the trailing end portion of the unwound material from the second roll, thereby forming a splice.

3,863,856
TAPE REEL DRIVE MECHANISM

Bartholomew F. Conlon, Jr., Waynesboro, Va., assignor to General Electric Co., Lynn, Mass.

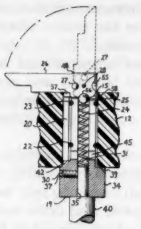
Filed Mar. 15, 1973, Ser. No. 341,368
Int. Cl. B65h 19/02
U.S. Cl. 242—68.3 9 Claims

1. A mechanism for driving a reel having a central circular hub opening from a motor driven shaft comprising:

a. a drive member having a collar and a cylindrical shaft portion extending from the collar, at least a part of the shaft portion including the end remote from the collar being bifurcated to form first and second spaced opposed shaft segments, the shaft portion being adapted to extend through and fit loosely within the reel hub opening;

b. a pivotally mounted cam means having cam surfaces rotatable into the space between the shaft segments so that the cam surfaces increase the space between the shaft segments thereby urging the shaft segments into forcible contact with the reel hub;

c. means for pivotally mounting the cam means to the remote end of the bifurcated shaft; and

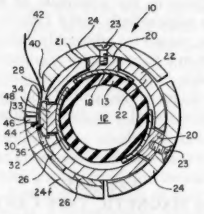


d. means for securing the collar to the motor driven shaft.

3,863,857
LEAF-TYPE EXPANSIBLE SHAFT WITH TRAPPER BAR

Geoffrey Smith, Nashua, N.H., assignor to Nim-Cor Inc., Nashua, N.H.

Filed Apr. 2, 1973, Ser. No. 346,769
Int. Cl. B65h 75/24, 75/28
U.S. Cl. 242—72 B 9 Claims



9. In an expansible shaft of the type having outwardly movable leaves extending along, and around, an intermediate cylinder, the combination of:

a plurality of said elongated leaves spaced around said cylinder, one said leaf being fixed to said cylinder in asymmetrical position to define a portion of a cylinder outlined when all of said leaves are expanded and having one axially extending lateral edge portion spaced from said cylinder to form a space therewith for receiving an end of a web;

the other said leaves being normally retracted but radially movable outwardly to define said cylindrical outline with said fixed leaf;

elongated clamping means on said intermediate cylinder, oppositely disposed to, and under, the lateral edge portion of said fixed leaf, in said space, for gripping said end of said web against said lateral edge portion of said fixed leaf, said means being radially movable in said space;

and means for moving said outwardly movable leaves and said clamping means radially inwardly and outwardly.

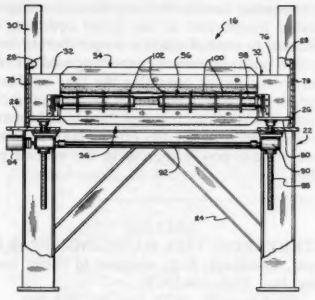
3,863,858
TENSIONING APPARATUS

Ford B. Cauffiel, and Herbert C. Trautman, both of Toledo, Ohio, assignors to Ford B. Cauffiel, Toledo, Ohio

Filed Nov. 9, 1973, Ser. No. 414,373
Int. Cl. B65h 23/10
U.S. Cl. 242—75.2 21 Claims

1. A tensioning device for maintaining substantially equal tension on a plurality of elongate, flexible members, said tensioning device comprising a first drag member, means for holding said drag member in a predetermined position, a second drag member, means for holding said second drag member facing said first drag member, said flexible, elongate

members being passed in a common direction between said drag members, means for establishing uniform pressure over a substantial portion of the length of said second drag member



to urge said second drag member toward said first drag member, supporting means for supporting both of said drag members, and at least two jackscrews engageable with said supporting means for raising and lowering said supporting means.

3,863,859

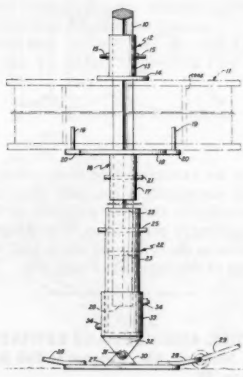
REEL SUPPORT AND WINDER APPARATUS

Horace J. Keith, Rt. 1, Box 31-C, Pearsall, Tex. 78061

Filed Feb. 21, 1974, Ser. No. 444,510

Int. Cl. B65h *75/14*

U.S. Cl. 242—77 **10 Claims**



1. Apparatus for supporting and turning a reel during winding and unwinding operations comprising a generally upright elongated shaft adapted to be driven rotatably by an overhead driving means, said shaft adapted to be assembled with a reel having an axial opening to receive the shaft completely therethrough with the shaft extending substantially above and below the reel during use of the apparatus, a reel positioning device adapted to be assembled onto said shaft above the reel thereon, means to releasably lock the positioning device in a selected adjusted position on said shaft with the positioning device engaging the top of the reel, a reel support and drive unit adapted to be assembled onto said shaft and locked relative to the shaft below said reel and in engagement with the bottom of the reel and having a positive driving connection with the bottom of the reel whereby said support and drive unit causes rotation of the reel with said shaft, and a holder and bearing device for said shaft mountable upon the lower end portion thereof in locked relation therewith and extending below the lower end of the shaft and serving as a journal for the shaft during rotation thereof with said reel, said holder and bearing device tiltable with the shaft and reel to various angular operational positions relative to ground.

3,863,860

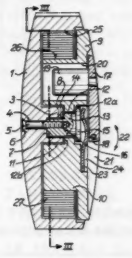
CASE FOR A LINEAR MEASURING DEVICE

Michel Quenot, Besancon, France, assignor to Stanley Mabo, Trepillot Besancon, France

Filed Jan. 19, 1973, Ser. No. 325,030

Int. Cl. B65h *75/16, 75/40*

U.S. Cl. 242—84.8 **2 Claims**



1. A case for a tape measure comprising, an outer shell defining a first side of a case for a tape measure and the periphery of said case, said outer case having an axial spindle, a cover disc defining a second side of said case and having a tape drum extending therefrom rotatable about said spindle, said drum having an internal collar, means defining an axial extension of said spindle having a head internally of said tape drum axially spaced from an inner end of said spindle defining an annular groove therewith receiving said collar of said tape drum for rotation therein, fastener means extending through said shell and spindle thereof removably holding said axial extension removably assembled to said spindle, a handle on said disc for rotating said cover disc, said spindle having a non-circular bore, said axial extension having a portion including a non-circular cross section received in said non-circular bore, said cover disc having a recess, a spring in said recess bearing against said handle for retaining it in a retracted position on said cover disc and an extended position when manually actuated to said extended position, said spring being removably received in said recess and frictionally bearing on said head of said axial extension, and said spring comprising a flat spring having a convex portion bearing against said handle and holding said cover disc against undesired rotation.

3,863,861

WIRE PAYING-OUT APPARATUS

Aldo Bellasio, Milan, Italy, assignor to Industrie Pirelli Societa per Azioni, Milan, Italy

Filed May 22, 1973, Ser. No. 362,770

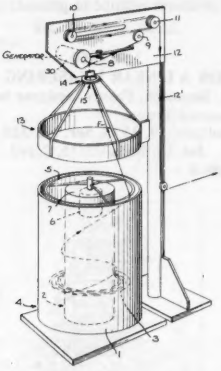
Claims priority, application Italy, June 13, 1972, 25588/72

Int. Cl. B65h *49/00*

U.S. Cl. 242—128 **4 Claims**

1. Apparatus for paying off wire stored in superimposed connected coils, said apparatus comprising a cylindrical body having said coils therearound, the exterior diameter of said body being smaller than the interior diameter of said coils whereby said coils are loosely arranged around said body, detaching means mounted for rotation around the axis of said body and spaced from said coils in the direction of paying off, said detaching means having a portion thereof engageable with said wire as it is payed off and movable in a circular path around said axis, and motor means connected to said detach-

ing means and rotating said detaching means in a direction which unwinds said coils and moving said portion of said



detaching means around said axis at a speed which is at least four times greater than the linear paying off speed of said wire.

3,863,862

KINEMATOGRAPH PROJECTION APPARATUS

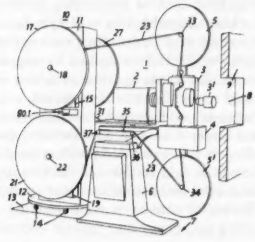
Peter Robins, New Driston, and Leroy G. Osborn, London, both of England, assignors to Westrex Company Limited, London, England

Filed July 24, 1972, Ser. No. 274,187

Claims priority, application Great Britain, July 28, 1971, 35390/71

Int. Cl. G03b *1/04*

U.S. Cl. 242—181 **10 Claims**



2. Film pay-off and take-up apparatus for a film projector comprising:

a. a housing rotatable about an axis on said projector between said first and second positions;

b. first and second pairs of motor-operable spindles supported by said housing, each of said pairs of spindles being capable of carrying respective pay-off and take-up film reels for film projection and rewind, means mounting said housing for rotation about said axis for movement with respect to said projector whereby when said housing is in said first position, pay-off and take-up reels carried by said first pair of spindles are aligned with said projector for film projection and pay-off and take-up reels carried by said second pair of spindles are controllable for film rewind, and whereby when said housing is in its second position, pay-off and take-up reels carried by said second pair of spindles are aligned with said projector for film projection and pay-off and take-up reels carried by said first pair of spindles are controllable for film rewind; and

c. driving means driving said motor-operable spindles including a separate motor for each spindle a first adjustable transformer, a second adjustable transformer, and a third adjustable transformer, means connecting said first adjustable transformer to the motor operating the film pay-off reel to control electric power thereto in the first projection position, means connecting said second transformer to the motor operating the take-up film reel to control electric power thereto in the first projector position, and means connecting said third transformer to both the motors operating the pay-off and take-up film reels to control electric power thereto in the second projector position.

3,863,863

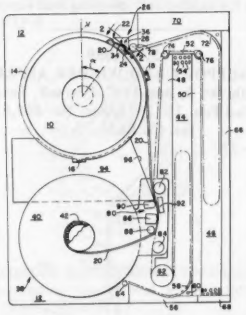
SELF-THREADING TAPE HANDLING APPARATUS

Don S. Ende, Commack, N.Y., assignor to Potter Instrument Company, Inc., Plainview, N.Y.

Filed June 30, 1972, Ser. No. 268,080

Int. Cl. G11b *15/66, 15/58*

U.S. Cl. 242—182 **25 Claims**



24. A system for extracting tape from a reel on which the tape is wound, comprising a rotatable reel, and jet means mounted externally to the reel adjacent to the periphery thereof for directing a pressurized fluid stream across said periphery parallel to the rotational axis of said reel in order to lift the free end of said tape off of said reel.

3,863,864

FILM TREADING ASSEMBLY AND REWIND ACTUATOR

Joerg Fischer, Madison, Ala., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 15, 1973, Ser. No. 323,620

Int. Cl. G03b *1/56;* **B65h** *17/14*

U.S. Cl. 242—192 **11 Claims**

1. In a motion picture projector operable in normal projection modes, in a threading mode and in a film rewind mode, the projector having a film supply to which the trailing end of a film is attached, means for transporting a length of film from the film supply, a film take-up for winding up a length of film, and rewind means for returning the length of film to the film supply, a film threading and rewind conditioning assembly comprising:

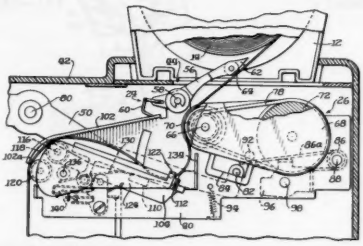
film drive means for transporting film from said film supply toward said take-up; means supporting said film drive means for movement between a threading condition in engagement with film in the film supply and a non-threading condition;

film stripper means for removing the leading end of a film from said film supply;

means supporting said stripper means for movement between a threading condition in engagement with film in the film supply and a non-threading condition;

a film guide channel means for guiding film from said stripper means and having a portion movable about a first axis between a threading condition and a non-threading condition; and

said movable film guide channel portion supporting a second axis for movement therewith;



a film tension sensor mounted on said second axis and movable with said movable channel portion when said channel portion is in said threading condition and movable independently of said movable channel portion about said second axis to actuate said film rewind means responsive to film tension when said movable channel portion is in said non-threading condition.

3,863,865

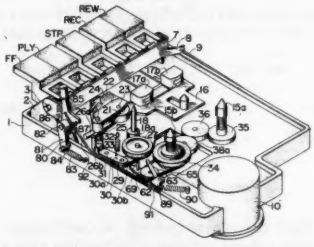
MAGNETIC RECORDING-REPRODUCING DEVICE

Keisuke Syohji, Nagoya, Japan, assignor to Shin-Shirasuna Electric Corporation, Nagoya-shi, Japan

Filed Mar. 7, 1973, Ser. No. 338,731

Int. Cl. B11b *15/32;* **G03b** *1/04*

U.S. Cl. 242—209 **3 Claims**



1. A magnetic recording -reproducing device employing a tape casette which contains a pair of reels and a magnetic tape wound thereon and having the opposite ends thereof securely fixed to said pair of reels respectively, said device comprising a drive motor, keyboard including depressible keys adapted, when depressed, to energize said drive motor, a capstan adapted to be rotated at a predetermined speed by means of said drive motor, a pinch roller adapted to be brought into and out of engagement with said capstan, a pair of reel spindles on which said pair of reels contained in said tape cassette are mounted respectively, said reel spindle being adapted, upon depression of a key or keys of said keyboard, to be rotated in a predetermined direction by means of said drive motor until said magnetic tape is fully wound from one of said reels onto the other one, slidable lock means for locking said key or keys in depressed position, and an automatic stop motion mechanism operatively associated with one of said reel spindles, characterized in that said automatic stop motion mechanism comprises slidable unlock means operatively connected to said slidable lock means and slidable in a direction substantially perpendicular to the direction of the sliding movement of said slidable lock means to thereby cause the latter to be slidden in such a direction as to release the locked key or keys, an actuator means operatively connected to said drive motor in such a manner as to be pivotally moved in a first area when said reel spindles are rotated in a first direction and in a second area when said reel spindles are rotated in a second direction and to be rectilinearly moved between said first and second areas when said reel spindles are stopped from rotating because of said magnetic tape having been fully wound from said one reel onto said other reel, wherein when rectilinearly moved said actuator means is brought into operational engagement with said slidable unlock means to cause the latter to be slidden in such a direction that said slidable lock means is thereby slidden in said direction, whereby said locked key or keys are released and said device is automatically shut off, irrespective of the direction and speed of transportation of said magnetic tape.

3,863,866

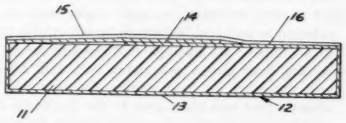
FABRIC REEL

Lee R. Ballard, Grand Prairie, and Joe G. Harris, Mansfield, both of Tex., assignors to Coit International Inc., Dallas, Tex.

Filed Mar. 19, 1973, Ser. No. 342,609

Int. Cl. B65h *75/06*

U.S. Cl. 242—222 **3 Claims**



1. A fabric reel of the type for supporting a bolt of fabric disposed around said reel, said fabric reel comprising, in combination:

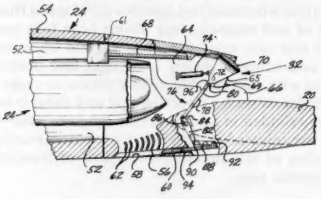
a. an elongated central core of synthetic resinous material defined by a rectangular parallelopiped having a pair of opposed longitudinally extending major faces, a pair of opposed longitudinally extending edge surfaces, and a pair of end surfaces transverse to said major faces and said edge surfaces, the junctions of intersection of said longitudinally extending major faces with said longitudinally extending edge surfaces being sharp, well-defined corners; and

b. an enclosing sheet of fibrous material having a pair of longitudinally extending end portions; said enclosing sheet extending completely about said core in close-fitting, but nonsecured, relationship with said core, thereby to enable relative movement between said enclosing sheet and said core; said enclosing sheet having a contour at the said junctions of intersection of said longitudinally extending major faces and said longitudinally extending edge surfaces conforming to said sharp, well-defined corners, thereby to resist any longitudinal movement of the fabric bolt relative to said reel, one of said longitudinally extending end portions of said enclosing sheet overlapping, and being adhesively sealed to, the other of said longitudinally extending end portions.

3,863,867
THRUST CONTROL APPARATUS FOR A JET PROPULSION ENGINE AND ACTUATING MECHANISM THEREFOR

Richard Ervin Souslin; James E. Klansnic, both of Bellevue, and Charles Kahler, Kirkland, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 26, 1973, Ser. No. 428,308
Int. Cl. B64c 15/06
U.S. Cl. 244—12 D 10 Claims



1. Thrust control apparatus in combination with a jet propulsion engine which develops thrust by discharge of a primary gas stream, said engine having a propulsive gas flow duct therein, said duct terminating at the rear end of said engine in an exhaust nozzle which normally directs said primary gas stream rearwardly from said engine, comprising:

conduit means associated with said engine and having an inlet in fluid communication with said duct and an outlet in fluid communication with the atmosphere, said conduit means being so oriented in relation to said engine as to divert a portion of the propulsive gas from said duct and to direct said portion from said outlet as a secondary gas stream in a downward and forward direction relative to the discharge direction of said primary gas stream,

valve means mounted on said engine and so located in relation to said conduit means to selectively vary the flow of propulsive gas through said conduit means,

reversing door means associated with said exhaust nozzle and mounted on said engine for swinging movement about a first axis transverse to the discharge direction of said primary gas stream, said reversing door means being mounted for movement between a first position in noninterfering relationship with said exhaust nozzle and a second position located rearwardly and downwardly of said first position wherein said reversing door means blocks said exhaust nozzle and diverts said primary gas stream for discharge forwardly from said engine,

throttling means mounted on said reversing door means and so associated therewith to selectively reduce the outlet area of said exhaust nozzle when said reversing door means is in said first position and when a portion of said propulsive gas is being diverted through said conduit means, and

actuating means mounted on said engine and so coupled to said valve means and to said throttling means to cause said valve means to open said conduit means to flow and to simultaneously cause said throttling means to reduce the outlet area of said exhaust nozzle.

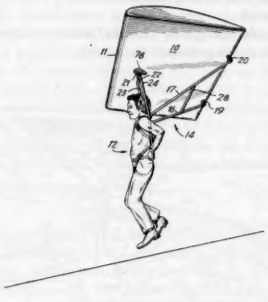
3,863,868
HANG GLIDER

Roger A. Oberle, 125 Canner St., New Haven, Conn. 06511

Filed Mar. 5, 1973, Ser. No. 337,895
Int. Cl. B64c 31/02
U.S. Cl. 244—16 11 Claims

1. A hang glider which comprises:

a. a wing having a continuous leading edge and an area and lift characteristic which is sufficient to dynamically support a person generally only when said wing is less than approximately three chord lengths from the ground, said wing having an aspect ratio in the range of 1.0 to 4.0, an area in the range of 15 to 100 square feet and a loading in the range of 2.0 to 6.25 pounds per square feet when said wing is dynamically supporting a person; and

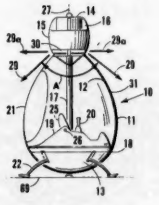


b. means for mounting said wing on a person such that the person is in generally vertical alignment with the center of pressure of said wing and said wing is not more than approximately two chord lengths from the ground when the person is standing on the ground.

3,863,869
VTOL CAPSULE AIRCRAFT

Gerhart Herman Bachman, Toronto, Ontario, Canada, assignor to Flight Capsule, Inc., Toronto, Canada

Filed Apr. 10, 1972, Ser. No. 242,451
Int. Cl. B64c 29/04
U.S. Cl. 244—23 D 3 Claims

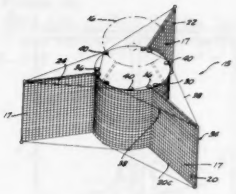


2. A flight capsule comprising, in combination; a central rigid control column defining a longitudinal axis; a jet engine mounted on one end of said column and having a thrust outlet opening defining a thrust axis extending towards the other end of said column and coincident with said longitudinal axis; structure mounted on said column adjacent said one end thereof and deflecting exhaust gases from said engine to define a plurality of thrust streams diverging outwardly towards said other end of said column; a hollow capsule body mounted upon and surrounding said column and disposed entirely within said thrust streams; and nozzle structures for each of said thrust streams including control means associated therewith and available to an operator for moving each of said thrust streams between an angle of substantially 90° to said axis through a control angle of substantially 60 degrees, said control means being in the form of a pilot operable joystick and independent hydraulic acutators extending from said joystick to said nozzle structures; and a lift control lever for adjusting the angles of all said thrust nozzle structures simultaneously.

3,863,870
SPIN STABILIZED VEHICLE AND SOLAR CELL ARRANGEMENT THEREFOR

George J. Andrews, Los Angeles, and Harold A. Rosen, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 270,107, July 10, 1972, abandoned, which is a division of Ser. No. 886,332, Dec. 18, 1969, Pat. No. 3,722,840. This application Oct. 25, 1973, Ser. No. 409,518
Int. Cl. B64g 1/10
U.S. Cl. 244—173 4 Claims

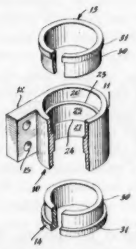


1. A vehicle comprising:
a. a body having a substantially cylindrical portion with a substantially round circumference and a central axis,
b. three rollers rotatably mounted to said body at substantially uniformly spaced locations around the circumference thereof substantially parallel to said central axis,
c. three flexible substantially rectangular elongated solar panels each mounted to a single one of said rollers and having side surfaces,
d. a plurality of photovoltaic cells mounted on the cylindrical surface of said body and on the side surfaces of said panels, and
e. means to deploy said panels from a first position wherein said panels are retracted to said body and rolled up about said rollers to a second position wherein said panels extend substantially radially outwardly from said body and substantially coplanar with said central axis.

3,863,871
VIBRATION ISOLATION MOUNTING ASSEMBLY

Daniel T. Meisenheimer, Jr., 404 Longmeadow Rd., Orange, Conn.

Filed May 14, 1973, Ser. No. 359,794
Int. Cl. F16s 1/36
U.S. Cl. 248—15 6 Claims

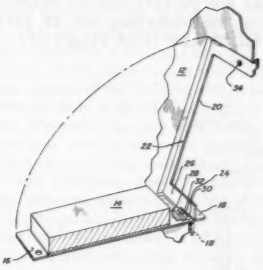


1. A mounting bracket for supporting a control having a body flanked by radially outwardly protruding surfaces and for isolating the control from vibration and amplified vibratory loads, the mounting bracket comprising a body portion loosely surrounding the control body, the interior of the body portion of the mounting bracket having inwardly disposed shoulders spaced from either end thereof, and two resilient bushings, each resilient bushing mating with the interior of the body portion of the mounting bracket between the shoulder and the open end thereof, the inner end of the resilient bushing abutting against the inwardly disposed shoulder and the outer end of the resilient bushing extending outwardly beyond the open end of the body portion of the mounting bracket, the body portions of the mounting bracket and the resilient bushings being of a size such that the resilient bushings are not compressed when the control is mounted therein, wherein the control is supported in the body portion of the mounting bracket by the resilient bushings, radial support of the control being provided by the portions of the resilient bushings between the interior of the body portion of the mounting bracket and the exterior of the control housing and axial support of the control being provided by the portions of the resilient bushings between the shoulders of the body portion of the mounting bracket and the radially outward protruding surfaces flanking the body of the control.

3,863,872
READOUT PANEL

Giles P. Godes, Brookings, S. Dak., assignor to Daktronics, Inc., Brookings, S. Dak.

Filed Nov. 24, 1972, Ser. No. 309,254
Int. Cl. G12b 9/00
U.S. Cl. 248—27 9 Claims



1. A readout panel comprising a mounting plate and a readout assembly wherein one of said plate and assembly includes an aperture and an embossment formed by a first and second surface which first and second surfaces adjoin and are substantially normal to each other, said aperture being at the juncture of said first and second surfaces, and one of said plate and said assembly includes a tab, said tab being inserted into the aperture to physically interconnect the plate and assembly while permitting pivotal movement of the plate and assembly to an open position to afford free and open access to the assembly for minor maintenance and permitting ready separation of the plate and assembly by withdrawal of the tab from the aperture to facilitate removal of an assembly for major maintenance and for minor maintenance under conditions which require immediate return to service of a display device incorporating the readout panel.

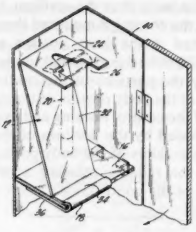
3,863,873
SUPPORTING DEVICE

Paul Richard Cushing, Box 68, Stony Brook, N.Y. 11790

Filed July 23, 1973, Ser. No. 381,803
Int. Cl. F16m 13/00
U.S. Cl. 248—110 5 Claims

1. A unitary supporting device comprising a substantially Z-shaped member including an upper horizontal arm having a slot therein, a horizontal base, and a downwardly and forwardly extending interconnecting member extending between and connecting said arm and said base, said base including clip means integrally and resiliently interconnecting said base and said interconnecting member at the front of said base for

engagement with a horizontal projecting element with said element being received and resiliently clamped between said



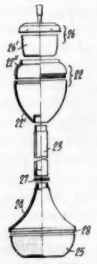
base and said clip means, said clip means being arcuate and curving downwardly and inwardly over the top of said base.

3,863,874

INTERCHANGEABLE CONJUGABLE ELEMENT ASSEMBLY FOR MAKING UP FURNISHING FITTINGS

Adele Pirovano, Via Zara 3, Nova Milanese, Italy

Filed Feb. 20, 1973, Ser. No. 333,512
Claims priority, application Italy, Feb. 29, 1972, 21194/72
Int. Cl. A24f *19/00*; F16m *11/22*
U.S. Cl. 248—150 **10 Claims**



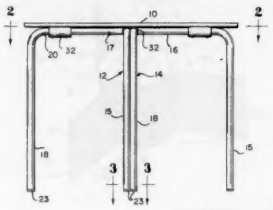
1. A knockdown set of conjugable interchangeable elements for combining in numerous ways to make up furnishing fittings, such as ash-trays, pot-holders, lamp-holders, flower-vases, paper-holders and waste-holders, the set of elements being of such a nature as to take a first orientation or to be inverted in the finished furnishing fitting so as to obtain different shapes, and comprising: an open cup of external convex shape for serving as the top or, when inverted, the bottom of the completed furnishing fitting; at least one tubular supporting section for connection with other sections of a same or different length; a flared bell base of external concave shape for use as a floor bearing or, when inverted, for use as the top of the complete furnishing fitting; a flat ballast cup having a torical periphery for containing ballast material and coupling with the open edge of said flared bell base; a flat basin of a wide base and a lesser height than said ballast cup for coupling with the open edge of said flared bell base; a flat ash-tray having a peripheral lip applicable to the open edge of the flared bell base when the latter is in an attitude with its open edge upward; a cover adapted to be secured to the top open edge of said open cup when serving as the top, or bottom adapted to be secured to the bottom open edge of said cup when serving as the bottom; a thin planar plate adapted to be horizontally connected in the furnishing fitting as an article-stand; a shaped plane provided at least on one side with a V-shaped extension for use as a paper-holder; a series of connection fittings for removably interconnecting said elements together to define said furnishing fittings, said connection fittings being operative in a first sense and in an inverted sense.

3,863,875

SUPPORTING FRAME FOR A TABLE

Ogden R. Olson, Columbus, Ohio, assignor to Cosco, Inc., Columbus, Ind.

Filed Jan. 2, 1974, Ser. No. 429,507
Int. Cl. A47b *13/06*
U.S. Cl. 248—188.1 **10 Claims**



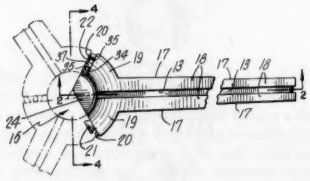
1. A supporting frame assembly for a table top, comprising a set of first frames each having a vertically extending leg and first and second horizontally extending arms, said first arm being integrally joined at its opposed ends to said leg and second arm and said second arm being angularly disposed with respect to said first arm, a set of second leg frames each having a vertically extending leg integrally joined to a horizontally extending third arm, each of said first frames having its leg connected to a leg on an adjacent one of said second frames and its second arm connected to the third arm on another one of said adjacent second frames, whereby each of the frames in each set of frames is connected to a pair of frames in the other set.

3,863,876

UPRIGHT SUPPORT

Laurence Stephen Finkelstein, and Gabor Gellert, both of Montreal, Quebec, Canada, assignors to Cantreco Ltd., Montreal, Quebec, Canada

Filed Feb. 1, 1973, Ser. No. 328,689
Int. Cl. A47c *7/00*
U.S. Cl. 248—188.7 **7 Claims**



1. An upright support comprising three interlocking leg members each having a leg section and a cup forming flange at a connecting end thereof, said cup forming flange defining a front face and opposed arms projecting angularly forward and one on each side of said leg section, each of said arms having a substantially flat vertical end face, an elongated vertical tongue molded along one of said end faces of one of said arms of said opposed arms, an elongated vertical groove formed in the end face of the other of said arms, said tongue and groove each having a transverse cross-section of a configuration to permit said tongue to be slideably received and retained in a groove of an adjacent leg member to interlock therewith, and a stop post in the lower portion of only two of

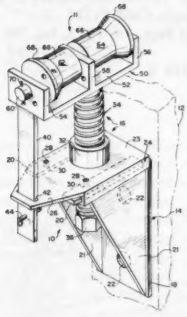
said grooves to limit the sliding movement of a tongue therein to provide vertical alignment of said three leg members, said three leg members when interlocked together forming a hollow central circular cup between the front face of each cup forming flange.

3,863,877

TRACTION HEAD FOR A COLUMN-MOUNTED SHORING BRACKET

R. Kirk Gregory, Barrington, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed June 1, 1973, Ser. No. 365,957
Int. Cl. A47f 5/10; A47h 33/00
U.S. Cl. 248—295 2 Claims



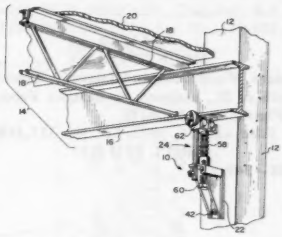
1. A traction head designed for the rolling support of a horizontal stringer that is associated with a formwork for concrete, said head comprising a rolled-supporting frame having a swivel connection whereby it may be secured to a shoring support for the stringer, said frame comprising a bottom plate, a pair of upstanding end plates, and a central upstanding plate disposed midway between the end plates, said plates being of substantially equal height and provided with aligned holes therethrough, a horizontal shaft projecting through said holes above the level of said bottom plate and having its opposite ends and medial region removably supported by said plates, a pair of stringer-supporting rollers rotatably mounted on said shaft on opposite sides of said central plate, each roller substantially spanning the distance between said central plate and the adjacent side plate, each of said rollers being of half-spool design and including a cylindrical section and a single radially extending flange, the upper end of said central plate terminating below the level of the uppermost portion of the cylindrical section of each roller, said rollers being reversible in end-to-end fashion on the shaft whereby, when they are positioned thereon so that the end flanges are remote from each other, the cylindrical sections are adapted to make tangential rolling contact with the base of a single I-beam type stringer while the end flanges function as edge guides which straddle said base, and when they are positioned on the shaft so that the end flanges are in close proximity to each other, the cylindrical sections are adapted to make tangential rolling contact with the spaced apart base sections of a split, channel-formed stringer while the end flanges project between said base sections and constitute a center guide therefor, and removable means on at least one end of said shaft disposed exteriorly of the adjacent end plate and adapted to retain said shaft in position on said plates against endwise removal from said aligned holes.

3,863,878

COLUMN-MOUNTED SHORING BRACKET ASSEMBLY FOR OVERHEAD FORMWORK

R. Kirk Gregory, Barrington, and Richard T. Dagiel, Elk Grove Village, both of Ill., assignors to Symons Corporation, Des Plaines, Ill.

Filed June 4, 1973, Ser. No. 366,470
Int. Cl. A47f 5/10; A47h 33/00; E04g 17/16
U.S. Cl. 248—295 10 Claims



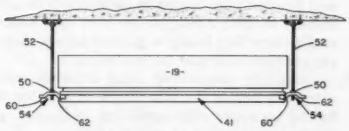
1. A shoring bracket adapted releasably to support a horizontal stringer forming a part of a concrete-receiving formwork-type pallet used in the erection of a multi-story building, said bracket comprising a two-part structure of a shelf part and a jack part, said shelf part being adapted for mounting it on a vertical column of the building and having an arm projecting outwardly from such column, said jack part including a base plate mountable on said arm, means for releasably securing said base plate to said arm, an elongated vertically extending jack screw having threaded engagement with the base plate and projecting upwardly thereabove, a frame mounted for swiveling movement on the upper end of said jack screw, a stringer-supporting roller carried by said frame and mounted for rotation about a horizontal axis, and an anti-torque connection extending between said frame and base plate and adapted to prevent rotational movement of the frame about the vertical axis of the jack screw when the latter is rotated for stringer raising or lowering purposes.

3,863,879

APPARATUS FOR MOUNTING A CEILING AIR TERMINAL

Carl C. Herb, Camillus, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 26, 1973, Ser. No. 336,106
Int. Cl. E04g 17/18
U.S. Cl. 248—327 3 Claims



1. Apparatus for mounting a plurality of serially connected ceiling air terminals in an installation having a false ceiling, a plurality of elongated rods being employed to suspend components of said false ceiling beneath the actual ceiling of a space having conditioned air from said terminal supplied thereinto, said apparatus comprising:

a first member suitably secured onto one of said elongated rods;

a second member suitably secured onto a second of said elongated rods, said first and second rods being axially aligned and spaced apart a distance substantially equal to the axial length of one of said ceiling terminals; and

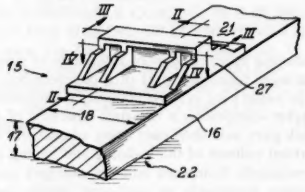
first and second mounting means secured in engaging relationship respectively to each of said first and second members and being readily disengageable therefrom each of said mounting means including at least a first portion for engaging one of said ceiling air terminals, and a second portion for engaging a second of said ceiling air terminals, each consecutive pair of mounting means thereby supporting a first end of one ceiling air terminal, each end of a second terminal, and a first end of a third air terminal.

3,863,880

MOUNTING BASE

Henry Lindner, Wood Dale, and James D. Kennedy, Streamwood, both of Ill., assignors to Beatrice Foods Co., Elgin Molded Plastics Div., Elgin, Ill.

Filed Apr. 16, 1973, Ser. No. 351,310
Int. Cl. E01f *9/10*
U.S. Cl. 248—349 **11 Claims**



1. A mounting base for a display device or the like comprising:

A. an elongated pedestal whose width is generally substantially greater than the thickness thereof and which has a generally flattened, top, mid-section adapted to be generally horizontal in extent when the bottom of said pedestal rests on a generally level surface, said pedestal further having defined generally in a central region of said mid-section thereof a vertically extending, cross-sectionally round hole having a beveled edge region adjacent the bottom of said pedestal,

B. a swivel of single-piece, integral construction comprising:

1. a base portion having a generally quadrilateral perimeter and generally flat, spaced, generally parallel top and bottom faces,

2. a pivot pin projecting downwardly from about the center of said bottom face, said pivot pin being adapted to mate with said hole and being further adapted to have the terminal portion thereof expanded against said beveled edge region in an interlocked, circumferentially slidable configuration with said pedestal with said bottom face being in general face-to-face slidable engagement with said top mid-section,

3. a vertically upstanding ridge member transversely extending across the mid-region of said top face and having an upper edge extending in spaced, generally parallel relationship to said top face,

4. at least three vertically upstanding pairs of rib members, each one with spaced, generally parallel side walls, each said pair transversely extending across said top face perpendicularly to said ridge member in laterally spaced, symmetrical relationship to other pairs such that the members of each such pair abut in alignment against opposite respective opposed faces of said ridge member, said rib members having a height generally equal to said upper edge,

5. a cap plate means horizontally extending over said top edge and over at least a portion of said rib members and having spaced, generally parallel top and bottom faces, and

C. the interrelationship between said pedestal and said swivel being such that

1. said hole has a diameter which is greater than the average thickness of said base portion,

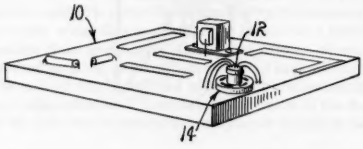
2. said terminal portion of said pivot pin is generally in face-to-face, slidable engagement with said pedestal to an extent such that said swivel resists lateral movement relative to said pedestal in reaponse to lateral force applied to said cap plate means.

3,863,881

SHOCK ABSORBING MOUNT FOR ELECTRICAL COMPONENTS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Robert F. Dillon, Jr., 17733 Contador Dr., Rowland Heights, Calif. 91748, and Robert C. Mayne, 2465 Shields St., La Crescenta, Calif. 91214

Filed Sept. 10, 1973, Ser. No. 395,687
Int. Cl. F16f *15/04*
U.S. Cl. 248—358 R **1 Claim**



1. A shock absorbing mount for use in mounting electrical components comprising:

A. means including a first member of an endless configuration adapted to receive in supporting relation an electrical component;

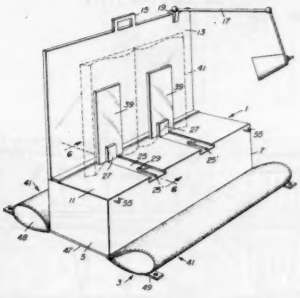
B. a second member of an endless configuration circumscribing the first member;

C. means for supporting said first member for motion relative to said second member, including a body of viscoelastic material interposed between said first and second members and affixed thereto;

D. means defining within said first member a first endless array of openings and means defining in said second member a second endless array of openings coaxially aligned with the openings of said first array; and

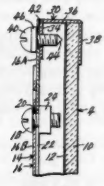
E. motion damping means mounted on said second member for limiting motion imparted to said first member relative to said second member, including an endless array of coplanar, rigidly supported snubbing pins disposed in an opposed relationship and extended through the openings of said second array of openings and into the openings of said first array, each of said snubbing pins being characterized by an elongated body having a base end portion rigidly connected with said second member and a distal end portion for engaging said first member having a diameter substantially less than the diameter of the openings of said first array of openings, and an annular shoulder disposed in closed proximity with said first member, whereby each of said snubbing pins is rigidly fixed to said second member and adapted to engage said first member as motion relative to said second member is imparted to said first member.

3,863,882
SELF-BALANCING SUPPORT
Constance Bannister Hatcher, P.O. Box 8, Syosset, L. I., N.Y. 11791
Filed May 30, 1972, Ser. No. 257,792
Int. Cl. A47b 97/04
U.S. Cl. 248—453 **4 Claims**



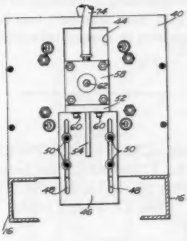
1. Means for supporting material in position viewable by the user, including in combination, a body upon which the material rests, means on said body in engagement with the material for holding it in viewable position by the user, and at least two balancing and supporting means connected to the body and movable and adjustable with respect thereto and with respect to each other and adapted to support said body in various positions with respect to the surface upon which it is supported, said at least two balancing means comprising a fluent material, wherein said balancing and supporting means comprise flexible casings containing fluent material, said casings being disposable laterally of said body and being of a length substantially the same as the length of the side of the body with respect to which they may be laterally disposed, the casings being connected to the body along one longitudinal edge whereby the casings may assume different positions relative to the body.

3,863,883
MIRROR BRACKET
Boyd E. Cousins, 4534 Main St., Kansas City, Mo. 64111
Filed Dec. 15, 1972, Ser. No. 315,517
Int. Cl. A47g 1/24
U.S. Cl. 248—477 **6 Claims**



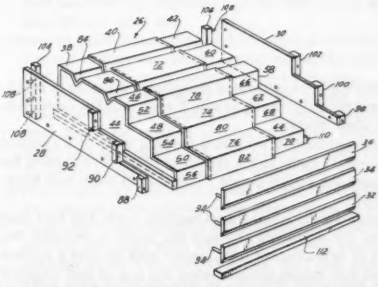
1. A mirror supporting bracket comprising:
a. a standard adapted to be affixed at its lower end to a furniture piece, and to extend thereabove,
b. an upper hook and a lower hook, and
c. means affixing said hooks to said standard, with said upper hook opening downwardly and said lower hook opening upwardly, both forwardly of said standard, whereby to engage therein the upper and lower edges of a mirror,
said means affixing said upper hook to said standard being operable to permit selective reversal of said upper hook to open either downwardly or upwardly, whereby in its upwardly opening position to serve as a suspension means over which suspension eyes of a mirror may be downwardly engaged to support said mirror.

3,863,884
ADJUSTABLE OPERATING CYLINDER FOR A GRAVITY CASTING MACHINE
Louis Saccoccio, 25 St. Mary's Dr., Cranston, R.I. 02903
Filed Sept. 26, 1973, Ser. No. 400,948
Int. Cl. B41b 11/66
U.S. Cl. 249—137 **4 Claims**



1. In a mold machine having a pivotally suspended base, a fixed plate mounted on said base, a movable plate on said base slidable toward and away from said fixed plate, a mold having one part mounted on said fixed plate and the other part mounted on said movable plate, and an adjustably mounted pneumatic cylinder having a piston coupled to said movable plate for moving said movable plate toward and away from said fixed plate, said cylinder mounting comprising a vertically mounted fixed plate, said fixed plate having a rectangular opening, an adjustable plate mounted on said fixed plate for vertical adjustment thereon, and a horizontal plate mounted on top of the adjustable plate and extending through said opening for supporting said cylinder.

3,863,885
FORM FOR CONCRETE STEPS
Bernard J. McLoughlin, 10 Hudson Dr., Troy, N.Y. 12180
Continuation-in-part of Ser. No. 128,028, March 25, 1971, abandoned. This application Jan. 2, 1974, Ser. No. 429,961
Int. Cl. B28b 7/28
U.S. Cl. 249—184 **1 Claim**



1. A form for molding concrete steps as an integral unit including in combination: a base member forming the inner side of said form, first, second and third base member elements of said base member, each of said first and second base member elements including a base member side wall, a base member tread extending from said base member side wall, and a base member riser extending from said base member side

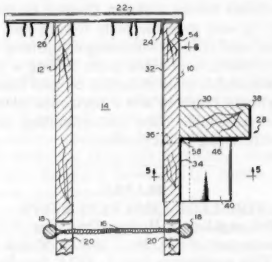
wall and joined to and forming an angle with said base member tread, the respective base member treads and respective risers of said first and second base member elements being aligned, said third base member element including a base member tread and a riser, slideable means whereby said first and second base member elements can be relatively slideably moved from a position of abutment to a spaced position, said third base member element continually with portions of the tread and riser thereof in abutment respectively with the treads and risers of said first and second base member element and said base member treads and risers providing a continuous concrete receiving surface of said base member whereby concrete can be applied directly thereto; first and second outer side wall members forming the outer side walls of said form; means for securing said outer side wall members in spaced relation to respective base member side walls; outer riser members corresponding in number to the number of base member risers of said base member; and means for securing said outer riser members in spaced relation to respective base member risers.

3,863,886

SUPPORT BRACKET FOR CONCRETE FORM

Dwight W. Carr, Rt. 1, Box 459, Casa Grande, Ariz. 85222

Filed July 16, 1973, Ser. No. 379,787
Int. Cl. E04g *11/06*
U.S. Cl. 249—192 **10 Claims**



1. A concrete form apparatus including a plurality of brackets for concrete form panels in which each bracket comprises:

a backing plate portion;

stop means separated from said backing plate by a distance substantially equal to the thickness of the form panels, for engaging the opposite side of the panels from said backing plate;

web means rigidly joining said backing plate and said stop means, for extending through the junction between the edges of two adjacent form panels with at least a portion of said web means spaced below the top of said adjacent panels; and

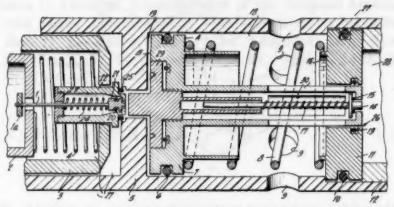
holder means fixedly attached to said bracket for holding an elongated support member so that said support member extends across the junction of said adjacent panels, said holder means being provided on the opposite side of said panels from said backing plate to clamp said panels between said support member and said backing plate.

3,863,887

PNEUMATICALLY-SERVOCONTROLLED, INSTANTLY-ESPONSIVE FLOATING VALVE, PARTICULARLY ADAPTED FOR UNDERWATER PNEUMATIC GUNS AND OTHER USES

Giuseppe Stradella, 13 via Roma; Fernando Gatti, 37 via Cavour; Giuliano Daniele, 144 via Roma, and Umberto Stradella, 13 via Roma, all of Recco, Italy

Filed Nov. 21, 1972, Ser. No. 308,588
Int. Cl. F16k *31/12*
U.S. Cl. 251—25 **4 Claims**



1. A pneumatically servocontrolled, instantly responsive floating valve, particularly designed for pneumatic underwater guns and other uses, mounted in a cylindrical body that can be inserted in an air-reservoir, characterized by servo-control means comprising a needle valve having a control rod and threaded disc engageable on a mobile sleeve that can be actuated through a suitable mechanism or trigger of the gun, said valve being preferably mounted in a cup-shaped valve body supported by a second mobile sleeve that is submitted to the thrust of a helical spring the apposite end of which bears against the former mobile sleeve, the latter assembly being mounted at an axial hole in a transverse wall of the cylindrical supporting body, said hole opening on the opposite side into a chamber wherein the floating valve proper is mounted, the latter valve being formed by a disc-shaped piston with toroidal sealing ring and tubular cylindrical projection provided with longitudinal slots, said projection being provided at its free and with an internal non-return valve having a guide stem around which a helical pressure spring in mounted, said projection being axially slidably and sealingly movable through a hole in a disc-shaped plate with a toroidal sealing ring being fixedly mounted in the cylindrical supporting body, the outer face of said disc-shaped plate being adjacent to an end of the barrel of the gun, a helical spring being mounted between the piston of the floating valve and said disc-shaped plate with the aid of suitable centering and guide means.

3,863,888

POWER OPERATED FLUID CONTROL VALVE

Paul D. Hines, 9634 Farragut Dr., Culver City, Calif. 90230

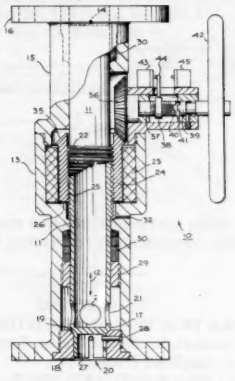
Filed Jan. 15, 1973, Ser. No. 323,995
Int. Cl. F16k *31/05*
U.S. Cl. 251—130 **16 Claims**

1. A power operated valve having an axial flow passage;

a non-rotatable but axially movable hollow valve stem in the axial flow passage in operating relationship with a valve closure;

said valve stem having external threads around a portion thereof;

motor means including a stator and a hollow rotor concentric with the axial flow passage;



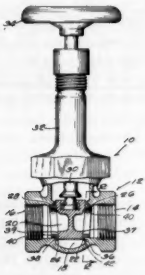
said rotor having internal threads for engaging said external threads in operational movement.

3,863,889

GATE VALVE

Bernie E. Robinson, Oak Creek, and Alfred L. Sachs, Wauwatosa, both of Wis., assignors to Milwaukee Valve Company, Inc., Milwaukee, Wis.

Filed Mar. 22, 1973, Ser. No. 343,818
Int. Cl. F16k 3/12
U.S. Cl. 251—328 **2 Claims**



1. A gate valve comprising

a body including opposed inlet and outlet ports and a chamber interposed said inlet and outlet ports defining a flow passage extending through said body, each of said ports including a bore and an annular shoulder surrounding the opening thereof into said valve chamber, said shoulder having an outer face facing said valve chamber and the planes of said shoulder faces being opposed and angularly related;

a tapered gate member located in said valve chamber and movably supported for reciprocative movement relative to said ports between an open position to permit flow through said flow passage and a closed position to shut off flow through said flow passage, said gate member having opposed, angularly related seating surfaces; and

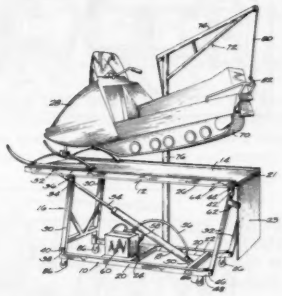
a seat ring mounted in each of said ports, each of said seat rings being stamped from a relatively thin sheet of stainless steel and including a tubular sleeve fitting snugly inside the respective of said bores and staked thereto and further including an annular flange extending radially outwardly from one end of said sleeve and rigidly seated against the respective of said shoulders, each of said seat ring flanges having a flat outer seating face which is sealingly engaged by the respective of said gate member seating surfaces when said gate member is in a closed position.

3,863,890

LIFT DEVICE FOR SMALL EQUIPMENT

Charles Ruffing, Rt. 1, Chilton, Wis. 53014

Continuation-in-part of Ser. No. 257,766, May 30, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 427,906
Int. Cl. B60p 1/16
U.S. Cl. 254—10 C **7 Claims**



1. A lift device for elevating small equipment to convenient working positions comprising:

a generally horizontally disposed base frame supported on a floor and having longitudinally spaced front and rear portions;

a vertically movable lift frame located above said base frame and carrying a platform for supporting the equipment, said lift frame and said platform having longitudinally spaced front and rear portions;

a fluid actuated ram pivotally connected at one end to said base frame and pivotally connected at the other end to said lift frame and located beneath said platform for moving said lift frame vertically relative to said base frame between a fully raised position and a fully lowered position where the equipment can be moved from the floor onto said platform;

means supported on said base frame and located beneath said platform for supplying a controlled flow of actuating fluid to said ram; and

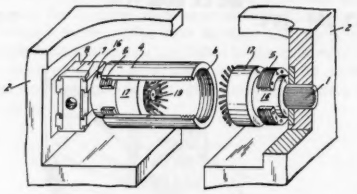
means pivotally connecting said lift frame to said base frame for said vertical movement in response to the actuation of said ram, said last-mentioned means including

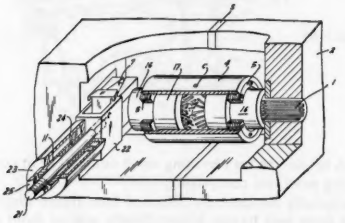
a first pair of laterally spaced front legs having lower ends which are pivotally connected to the front portion of said base frame for relative pivotal movement about a first pivot axis and upper ends which are pivotally connected to the front portion of said lift frame, and

a pair of laterally spaced rear legs having lower ends which are pivotally connected to the rear portion of said base frame for relative pivotal movement about a second axis and having upper ends which are pivotally connected to the rear portion of said lift frame, said first and second pivot axes being located at different elevations and said legs being angularly related such that, when said lift frame is in the fully raised position, said platform is substantially horizontal and, when said lift platform is in the fully lowered position, the rear portion of said platform is adjacent the floor and said platform is upwardly inclined towards the front portion to provide sufficient vertical clearance between said platform and said base frame for

accommodating said ram and said means for supplying a controlled flow of actuating fluid to said ram.

3,863,891
CONCRETE PRESTRESSING DEVICE
Constantin Leonte, Iasi, Romania, assignor to Institutue Politehnic Iasi, August, Romania
Division of Ser. No. 208,293, Dec. 15, 1971, Pat. No. 3,790,657. This application Jan. 4, 1974, Ser. No. 430,874
Int. Cl. E21b *19/00*
U.S. Cl. 254—29 A **3 Claims**





1. A device for stressing a beam having a longitudinally extending throughgoing cable projecting from said beam at least at one end thereof, said device comprising:

a wedge assembly surrounding said end of said cable and laterally removable therefrom, said assembly including a pair of oppositely converging wedge members and means relatively displaceable transversely to said cable to spread said members, one of said members bearing against said beam;

a cable clamp fixed to said end of said cable beyond said wedge assembly;

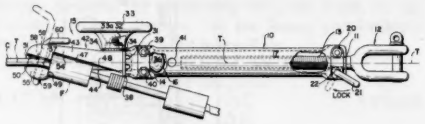
a sleeve interposed between said cable clamp and the other of said members and in axial force-transmitting relationship therewith;

an externally threaded ring mounted rotatably on said sleeve and having an external diameter in excess of that of said cable clamp and an internal diameter less than that of said cable clamp; and

an internally threaded pipe for joining said beam to a similar beam having a similar ring by threading said rings into opposite ends of said internally threaded pipe.

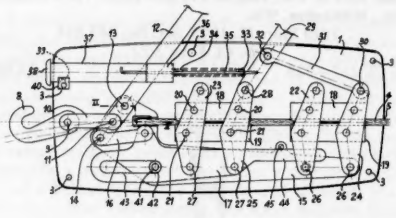
3,863,892
CABLE TENSIONER
John M. Di Martino, Sayville, N.Y., assignor to Line Fast Corporation, Farmingdale, N.Y.
Filed Apr. 14, 1972, Ser. No. 243,953
Int. Cl. B66f *3/08*
U.S. Cl. 254—67 **6 Claims**

1. A tensioner comprising a body, a first connector at a first end of said body, thread means for longitudinal adjustment of the body and first connector with respect to each other, a second connector at a second end of said body, rotary joint means for permitting free rotation of said second connector and said body with respect to each other, said body being divided into two longitudinal components each longitudinal component including a portion of each of said thread means



and said rotary joint means, and lock means for securing said longitudinal components in cooperating relationship.

3,863,893
CABLE TRACTION AND HOISTING APPARATUS
Michel Cavalieri, Neuilly sur Marne, France, assignor to Tractel S. A., Bagnobt, France
Filed June 21, 1973, Ser. No. 372,304
Claims priority, application France, June 27, 1972, 72.23182
Int. Cl. B66d *1/00*; B66f *1/00*
U.S. Cl. 254—76 **4 Claims**



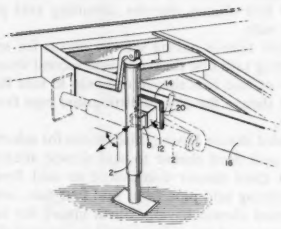
1. An apparatus for pulling and hoisting a load attached to one end of a cable comprising a casing having detachably connected halves and openings at each end, a pair of clamps each having a pair of superposed jaws, two pairs of tightening levers with each pair of levers interconnecting one of said pair of jaws, a first control rod axially positioned within said casing and being pivotally connected to an end of said levers of one of said clamps, a forward motion control lever having one end pivotally connected to said first control rod, a second control rod parallel to said first control rod and pivotally connected to an end of said levers of the other of said clamps and said forward motion control lever, said first and second control rods and said forward motion control lever each consisting of flat metal sheet elements, and anchoring hook extending through one of said casing openings, a link pivotally connected to said hook and said forward motion control lever at a position of said forward motion control lever, intermediate the positions where said forward motion control lever is pivotally connected to said first and second control rods, a deflecting plate carried laterally of and by one of said first and second control rods and said casing encasing the above elements and having a lateral opening adjacent said deflecting plate whereby a cable can extend through the other of said end openings, through said clamps and then be deflected by said deflecting plate through said casing lateral opening upon operation of said forward motion control lever.

3,863,894

JACKING APPARATUS FOR A TRAILER TONGUE

Joseph S. Mansi, and Larry W. Spence, both of Orlando, Okla., assignors to The Charles Machine Works, Inc., Perry, Okla.

Filed Sept. 20, 1973, Ser. No. 399,335
Int. Cl. B60s 9/02
U.S. Cl. 254—86 R 4 Claims



1. Trailer tongue jacking apparatus comprising:
a trailer having a tongue for connecting the trailer to a towing vehicle;
a variable length jacking mechanism;
a mounting member having a longitudinal axis generally normal to the longitudinal axis of said jacking mechanism, said member having a first portion of regular polygonal external cross section of constant dimension throughout its length and having a second portion of circular external cross section axially aligned with said first portion;
a mounting socket having a cavity of regular polygonal internal cross section, corresponding to said mounting member first portion external cross section, for supportably receiving and engaging said mounting member first portion, said socket having an aperture at one end extending axially of said cavity cross section for slidably and rotatably engaging said mounting member second portion, whereby said mounting member received and engaged by said socket may be axially withdrawn sufficiently to disengage said first portion from said cavity and may then be rotated within said aperture by engagement of said mounting member second portion with said aperture and may then be restored to said supportable engagement by said mounting member first portion being engaged with said cavity;
means biasing said mounting member into said supportable engagement with said mounting socket cavity; and
one of said mounting member and said mounting socket being attached to said jacking mechanism and the other having means attaching it to said trailer tongue.

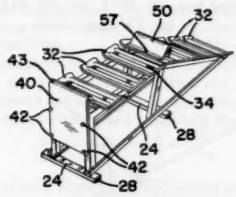
3,863,895

WHEEL RAMP

Ronald E. Grewe, Delphos, and Eugene L. Hoersten, Kalida, both of Ohio, assignors to The Huffman Manufacturing Company, Miamisburg, Ohio

Filed June 7, 1973, Ser. No. 367,854
Int. Cl. E02c 3/00
U.S. Cl. 254—88 8 Claims

1. A demountable wheel ramp comprising:
a. a pair of spaced apart, longitudinally extending, substantially flat, rigid side frames each formed of a plurality of side frame members lying substantially in a single plane,
b. means interconnecting permanently all of said side frame members of each side frame, forming integral side frames each having an upper section and an inclined section extending downwardly and rearwardly from said upper section,
c. transverse cross bracing extending between and interconnecting said spaced apart side frames,
d. said cross bracing including a plurality of separate, transversely extending treads mounted on said upper and inclined sections of said spaced apart side frames, and
e. readily disengagable fastening means attaching said cross bracing to said integral side frames and forming with said integral side frames a complete wheel ramp while permitting ready detachment of said cross bracing from said side frames,



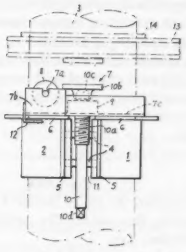
f. whereby said cross bracing and treads can be removed readily from said integral side frames and said side frames and cross bracing can be collapsed into a substantially flat, compact package for shipping and storage.

3,863,896

SUPPORT DEVICES FOR STRUCTURES, AND METHODS AND SYSTEMS EMBODYING THE SAME

Eric Hope, and John William Edward Petty, both of Woking, England, assignors to Richard Castain Limited, London, England

Filed Oct. 13, 1972, Ser. No. 297,383
Claims priority, application Great Britain, Oct. 15, 1971, 48175/71
Int. Cl. B66f 3/08
U.S. Cl. 254—98 3 Claims



1. A temporary support device for temporarily supporting a structure from an elongate support, comprising a releasable clamp member adapted to be detachably secured around the support and to frictionally grip the support, the clamp member comprising a two-part collar, the two collar parts being securable together, after location of the collar parts around the support, to immovably clamp the clamp member to the support, the collar parts including generally arcuate central portions defining a generally tubular support-receiving opening within which the support is clamped when the collar parts are secured together, each collar part further including structure-supporting elements comprising a pair of flanges extending from opposite sides of the associated central portion, the flanges of one collar part being disposed parallel to, but spaced from, the flanges of the other part, when the collar parts are secured to the support, the support device further including a structure-supporting arrangement co-operable with and supportable by said flanges, and provided with ad-

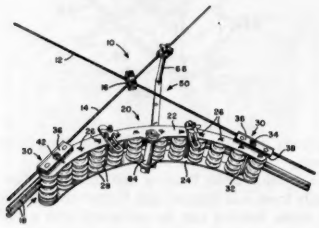
justable jack means capable of co-operating with the structure to support and adjust the height of the latter.

3,863,897

FLOATING CORNER MOUNTED BLOCK

David A. Yeager, Belington, W. Va., assignor to Jackson Communication Corporation, Clayton, Ohio

Filed Nov. 15, 1973, Ser. No. 415,938
Int. Cl. B66d *1/36*
U.S. Cl. 254—134.3 R **6 Claims**



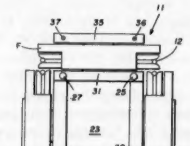
1. A corner mounted block adapted to be mounted at the intersection of a pair of crossed messenger strands comprising:
a. a roller supporting framework,
b. a plurality of sets of substantially coaxially mounted rollers rotatably mounted in said framework with cable engaging surfaces of said rollers defining an arcuate cable path,
c. means on said framework adjacent a first end of said arcuate path for engaging one of said crossed messenger strands at a point thereon spaced from the point of crossing of said messenger strands,
d. means on said framework adjacent a second end of said arcuate path for engaging the other of said crossed messenger strands at a point thereon spaced from said point of crossing of said messenger strands,
e. brace means extending between said framework and said one of said messenger strands,
f. means on said brace means for engaging said framework intermediate said ends of said arcuate path, and
g. means on said brace means for engaging said one of said messenger strands at a point thereon spaced from said framework.

3,863,898

CHANGING BLOCK HOISTING SYSTEM

Wayne L. Brackin, Beaumont, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 10, 1973, Ser. No. 395,466
Int. Cl. B66d *1/36*
U.S. Cl. 254—194 **2 Claims**



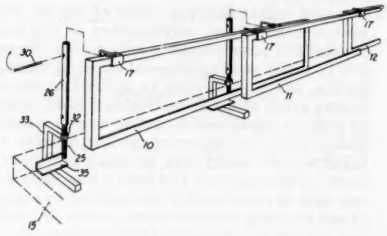
2. A hoisting apparatus for moving pipe within an oil well derrick, said hoisting apparatus including a traveling block with a side opening that may be changed from admitting the pipe from a first side to admitting the pipe from a second side, comprising:
a crown block with three sets of lines; and
a traveling block with
a first sheave connected to one set of lines,
a second sheave connected to another set of lines, and
a third sheave connected to the other set of lines,
said first sheave having first means for selectively connecting said first sheave to said second sheave at first side of said first sheave thereby admitting said pipe from said first side,
said first sheave having second means for selectively connecting said first sheave to said second sheave at a second side of said first sheave opposite to said first side of said first sheave thereby admitting said pipe from said second side,
said third sheave having third means for selectively connecting said third sheave to said second sheave at a side on said third sheave coincedent to said first side thereby admitting said pipe from said first side, and
said third sheave having fourth means for selectively connecting said third sheave to said second sheave at a side on said third sheave coincedent to said second side thereby admitting said pipe from said second side.

3,863,899

REMOVABLE GUARD RAIL

Richard W. Werner, 570 Forrest Rd. N.E., Atlanta, Ga. 30312

Filed Aug. 27, 1973, Ser. No. 391,539
Int. Cl. E04h *17/16*
U.S. Cl. 256—24 **14 Claims**



1. A removable guard rail comprising a stanchion having receiving means for receiving and holding a downwardly projecting section of a hook; means for securing said stanchion to a platform; a frame having a substantially horizontally extending rail; a collar slidably mounted to said frame rail, and a hook secured to said collar, said hook including a first section projecting laterally to one side of said frame rail and a second section projecting downwardly from said first hook section and removably received in said receiving means.

3,863,900

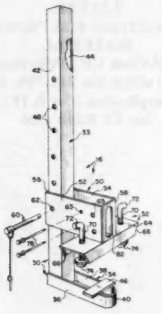
REMOVABLE GUARD RAIL ASSEMBLY AND STANCHION BRACKET THEREFOR

Richard T. Dagiel, Elk Grove Village, and Russell H. Plough, Chicago, both of Ill., assignors to Symons Corporation, Des Plaines, Ill.

Filed Apr. 13, 1973, Ser. No. 350,700
Int. Cl. E04h *17/14*
U.S. Cl. 256—59 **7 Claims**

1. A stanchion supporting bracket adapted to be removably clamped to a drop-off edge of an upper story level concrete floor slab or the like, said bracket comprising a pedestal having a foot member projecting laterally from the lower end thereof, a socket member projecting laterally from said pedestal above the level of said foot member and opposing the latter, said socket member being in the form of a loop of flat

metal stock and having sides which straddle the pedestal and a bight portion which is spaced outwardly from said pedestal, an upper jaw plate extending across the lower edges of the loop sides in overhanging relationship, said foot member and upper jaw plate being adapted to receive the edge region of the slab therebetween with the former underlying the slab and the latter overlying the slab, and a pair of clamping screws



threadedly received in the overhanging portions of said jaw plate, projecting downwardly therefrom and adapted when tightened against the upper face of the slab to draw the foot member into clamping engagement with the slab, said socket member and upper jaw plate defining an upwardly opening socket designed for reception therein of the lower end of a vertical guard rail supporting stanchion post.

3,863,901

APPARATUS FOR MIXING OF LIQUIDS AT AN ADJUSTABLE RATIO

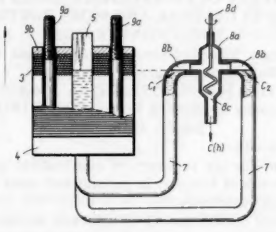
Ivan Janda, and Miroslav Barta, both of Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

Filed Oct. 15, 1973, Ser. No. 406,670

Claims priority, application Czechoslovakia, Oct. 13, 1972, 6912-72

Int. Cl. B01f *7/24*

U.S. Cl. 259—7 **3 Claims**



1. Apparatus for mixing liquids at an adjustable mixing ratio comprising;

a horizontal base plate,

a number of similar horizontally arranged plates with longitudinal cuts,

a vertical partition wall fixed to the base plate, the width of said partition wall being equal to the width of the longitudinal cuts in the plates,

the plates being piled on said base plate with the partition wall engaging into their longitudinal cuts,

the partition wall defining with each plate two separate spaces, the sum of the volumes of both said spaces being constant for each plate without regard to the position of the plate with respect to the partition wall,

fastening means for fixing the plates on the base plate in a predetermined relative position with respect to the partition wall,

the spaces of the piled up plates forming a chamber at each side of the partition wall,

discharge ports in the base plate at each side of the partition wall for discharging liquid from both of said chambers, and for mixing these liquids, said device being connected with the chambers,

means for adjustment of the height of the composite body comprising the base plate, the plates and the partition wall with respect to the device for equalizing the level of liquids in both chambers and for mixing these liquids.

3,863,902

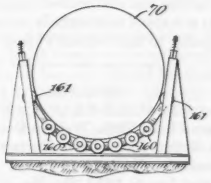
FLEXIBLE LINKAGE WHEEL SUPPORTED ROTATABLE DRUM

Richard Edward O'Brien, Geneva, and Arthur Raymond Simpson, Riverside, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Mar. 26, 1973, Ser. No. 344,531

Int. Cl. B01f *9/02*

U.S. Cl. 259—89 **21 Claims**



1. Apparatus comprising:

a horizontally positioned rotatable cylindrical drum;

a pair of spaced-apart circular track means mounted circumferentially on the drum;

a pair of spaced-apart nontraveling chains suspending said drum in cradled arrangement with the chains in tension; each chain having two ends, with the ends of each chain connected to a support means;

a plurality of wheels rotatably mounted on spaced-apart axles supported by each chain, said wheels rotatably contacting one of the track means and thereby rotatably supporting the drum;

the axis of the drum being substantially parallel to the axes of the wheels;

said chain and wheels being unrestrained apart form the drum and said support means and;

power drive means connected to said drum to rotate said drum while being cradled between said chains.

3,863,903

AGITATOR ASSEMBLY FOR MIXING PAINT

John Brehmer, Cary; Russell C. Brewer, Bellwood, and John W. Robinson, Libertyville, all of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

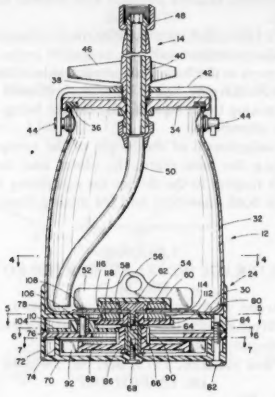
Filed Jan. 11, 1974, Ser. No. 432,556

Int. Cl. B01f *7/18*

U.S. Cl. 259—108 **14 Claims**

1. An agitator assembly for a paint cup having a back wall and a peripheral wall, comprising a first magnet, an impeller, means securing said impeller to said first magnet, means on the back wall of said paint cup for rotatably supporting said first magnet and impeller in said paint cup, a second magnet, means supporting said second magnet for coaxial rotation with said first magnet and external to said cup in a position adjacent to said cup back wall for rotating said first magnet in

response to rotation of said second magnet, an air turbine, a plurality of speed reduction gears, and means rotatably supporting said gears and turbine with said gears interconnected



between said turbine and said second magnet for rotating said second magnet at a speed substantially below the speed of said turbine in response to the rotation of said turbine.

3,863,904

MIXING OF FRAGILE GRANULAR MATERIALS

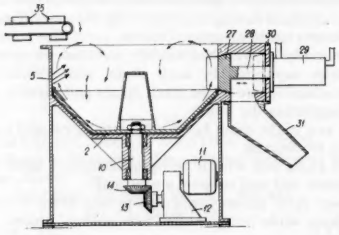
Rudolf Ferdinand Leon Milik, Welwyn Garden City, England, assignor to Design Link, Little Burrow, Welwyn Garden City, Hertfordshire, England

Filed Jan. 5, 1973, Ser. No. 321,225

Claims priority, application Great Britain, Jan. 18, 1972, 2395/72The portion of the term of this patent subsequent to Aug. 7, 1990, has been disclaimed.

Int. Cl. B01f *3/08, 7/26*

U.S. Cl. 259—148 **4 Claims**



1. A method of mixing together at least two materials, at least one of which is in the form of fragile granules having a bulk density of less than about 70 lb per cubic foot, said method comprising the steps of supplying said materials to a circular dish-shaped surface, having an inclined peripheral portion which is substantially free of projections and has its edge surrounded by a wall surface extending directly substantially vertically upwardly at an obtuse but sharply defined angle to said peripheral portion, holding said wall surface stationary while rotating said dish-shaped surface about a vertical central axis at a peripheral speed of from about 400 to about 2500 feet per minute and for a period of from the order of 5 to the order of 7 seconds and thereby imparting a rotation to said materials and flinging said materials centrifugally outwards and upwards against said stationary wall surface, contact with said wall surface retarding said rotation of said materials and directing said materials inwards towards said axis whence they fall downwards again onto said dish-shaped surface, whereby said materials form a toroidally shaped mass around said peripheral portion of said dish-shaped surface and said materials circulate along a helical path around said toroidally shaped mass.

3,863,905

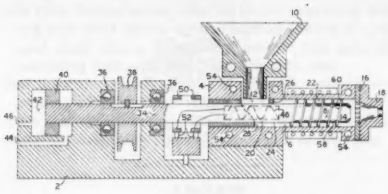
APPARATUS AND METHOD FOR PROCESSING PLASTIC MATERIAL

Bryce Maxwell, 19 McCosh Cir., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 242,700, April 10, 1972, Pat. No. 3,790,328. This application May 9, 1973, Ser. No. 358,656

Int. Cl. B29b *1/06*

U.S. Cl. 259—191 **15 Claims**



1. Apparatus for use in processing plastic material comprising a casing having a tubular bore therein, having an inlet opening near one end thereof and a discharge opening near the opposite end thereof, (an essentially cylindrical rotor located in said bore) a rotor in said bore having a cylindrical form in that portion thereof located adjacent said inlet opening, means for rotating said rotor in a predetermined direction, said casing and rotor having cooperating surfaces defining an inlet zone located near said inlet opening, and means for advancing material from said inlet zone towards said discharge outlet including a stationary member surrounding that portion of the rotor adjacent said inlet zone and presenting a helical surface facing toward said discharge opening and inclined in said predetermined direction throughout at least 360° circumferentially of said rotor.

3,863,906

RECOVERY OF COMBUSTIBLE GASES FROM FURNACES IN GENERAL AND MORE PARTICULARLY FROM CONVERTERS

Pierre Georges Vicard, Lyon, France, assignor to Societe"-Lab.", Villeurbanne, France

Filed Feb. 28, 1973, Ser. No. 336,815

Claims priority, application France, Mar. 3, 1972, 72.08901

Int. Cl. C21c *5/40*

U.S. Cl. 266—16 **5 Claims**

1. A plant for the recovery of combustible gases issuing from the mouth of furnaces in general and more particularly of converters comprising:

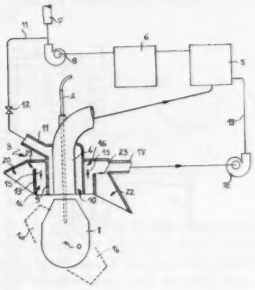
- an exhaust conduit having an inlet end and an outlet end, with said inlet end being disposed above the furnace mouth to collect combustible gases issuing therefrom;
- a combustion chamber separate from said exhaust conduit with the outlet end of said exhaust conduit opening into said chamber;

an auxiliary air conduit having an annular inlet located around the inlet of said exhaust conduit above the furnace mouth to withdraw ambient air from the perimeter of said mouth, and an outlet end opening into said combustion chamber to supply same with comburent air to cause combustion of said combustible gases within said combustion chamber, thus producing burnt gases therein;

- means to discharge outwardly said burnt gases from said combustion chamber;

gas propelling means to cause said combustible gases to flow through said exhaust conduit into said combustion chamber and said burnt gases from same to said discharge means;

air propelling means to cause air to flow through said auxiliary air conduit into said combustion chamber;



- said gas propelling means comprising a first blower having its low pressure side connected with said combustion chamber;
- and said air propelling means being formed of a second blower disposed in said auxiliary air conduit.

3,863,907

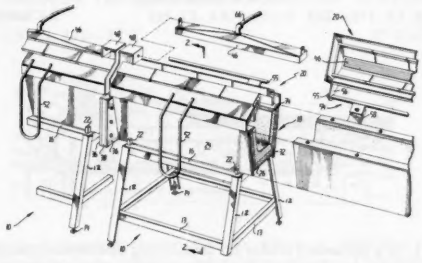
RADIANT HEATING SYSTEM

Fred W. Pierson, Sr., and Fred W. Pierson, Jr., both of Grand Rapids, Mich., assignors to M & T Manfuacturing Company, Grand Rapids, Mich.

Continuation-in-part of Ser. No. 300,168, Oct. 24, 1972, abandoned. This application June 10, 1974, Ser. No. 477,822

Int. Cl. F27b *19/00*

U.S. Cl. 266—34 R **4 Claims**



1. A cover construction for use in conveying molten nonferrous metal in a substantially U-shaped trough member having upwardly extending front and rear side wall members and having an open top end, said cover construction comprising:

a. means for supporting a radiant heater member substantially centrally of said cover member,

b. heat reflecting means extending longitudinally of said cover construction,

c. hinge means on said cover construction,

d. handle means cooperating with said hinge means for movement of said cover construction into and out of close proximity with respect to the open end of said U-shaped trough member,

e. and longitudinally extending skirt means which extend along opposite longitudinal sides of said U-shaped trough member,

l. said skirt means being spaced slightly outwardly from the uppermost ends to said front and side wall members to effect venting of gases from within said trough with said venting occurring substantially along the entire length of said trough member.

3,863,908

CELLULAR, RESINOUS PRODUCTS AND METHODS AND APPARATUS FOR MAKING THEM

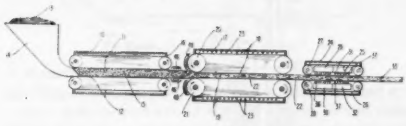
Maurice Charpentier, Rantigny, France, assignor to Saint-Gobain, Nurilly-sur-Seine, France

Continuation of Ser. No. 681,515, Nov. 8, 1967, abandoned. This application Jan. 1, 1971, Ser. No. 105,661

Claims priority, application France, Apr. 15, 1965, 65.13377; Nov. 10, 1966, 66.83268

Int. Cl. B29d *27/00, 27/08*

U.S. Cl. 264—45.5 A **8 Claims**



1. The method of forming a cellular sheet from expanded polystyrene pearls which comprises introducing the pearls into the first of a series of tunnels defined by sheet shaping belt conveyors, heating the pearls to their softening temperature in an upstream tunnel without substantial compression until they are autogeneously welded together into a porous body by blowing hot gases through the pearls in said tunnel, continuing to blow hot gases through the body to maintain the temperature of the body, passing the body into a downstream tunnel while at the softening temperature and compressing it therein to its definitive dimensions, cooling the body under compression to solidify it, passing the body into a further downstream tunnel, and reheating at least one surface of the body above the softening temperature, without substantial compression and without raising the core of the body to the softening temperature, until the surface softens and becomes smooth, and cooling the body.

3,863,909

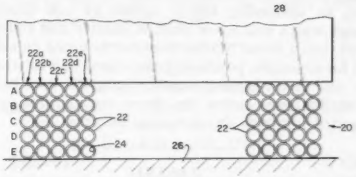
MULTI-TUBULAR SPRINGS

Milton N. Weber, Dearborn, Mich., assignor to Barry Wright Corporation, Watertown, Mass.

Filed July 9, 1973, Ser. No. 377,243

Int. Cl. F16f *7/12*

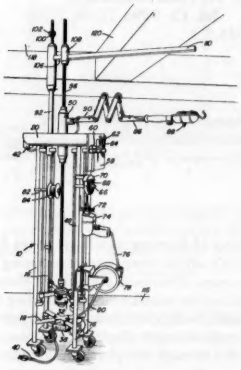
U.S. Cl. 267—140 **18 Claims**



1. A spring comprising a plurality of tubular spring elements arranged in groups in substantially parallel planes with each member of each group extending parallel to the other members of the same group, each of said spring elements being made of a resilient material so that it is capable of collapsing under a load applied transversely of its longitudinal axis and of automatically regaining its original cross-sectional configuration on removal of said load, and the members of each group

engaging and being bonded to each other and also adjacent members of each adjacent group so as to form a totally integrated structure with said members in load-transmitting relation with each other.

3,863,910
OVERHEAD DUCT AND PIPE SUPPORT
Earnest R. Warax, P.O. Box 111, Jacksboro, Tenn. 37757
Filed Oct. 17, 1973, Ser. No. 407,202
Int. Cl. B25b *11/02*
U.S. Cl. 269—11 **8 Claims**



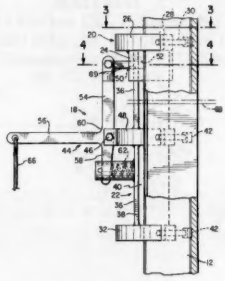
1. An overhead support for use between vertically spaced downwardly and upwardly facing upper and lower surfaces, respectively, said support including an upright stand, the lower end of said stand being adapted for support from said lower surface, the upper end of said stand including upwardly extendable abutment means for engagement with said upper surface, a generally horizontal laterally outwardly projecting support arm carried by the upper portion of said stand and supported from the latter for guided vertical shifting relative thereto, and positioning means connected between said support arm and stand operative to adjustably vertically shift said support arm relative to said stand, including extending guide means, a follower assembly guidingly engaged with said guide means for adjustable shifting therealong, said positioning means including a reversible electric motor supported from said follower assembly and an upstanding screw shaft driven by said motor and threaded through an upper portion of said stand, an upstanding sleeve carried by said support arm through which said screw shaft is slidably and rotatably received, and a thrust bearing member mounted on said screw shaft for adjustable positioning therealong and rotation therewith, said thrust bearing member being disposed below said sleeve, the lower end of the sleeve resting upon and being supported from said thrust bearing member.

3,863,911
RELEASABLE CLAMP
Roy J. McWilliams, Pomona, N.Y., assignor to Decair Helicopters, Inc., Spring Valley, N.Y.
Filed Aug. 13, 1973, Ser. No. 387,733
Int. Cl. B25b *5/16*
U.S. Cl. 269—152 **11 Claims**

1. A clamp adapted for attachment to a unitary member which is to be severed to form adjacent separated parts, said clamp being adapted temporarily and detachably to hold said parts in position subsequent to severance, comprising:

a first clamp element attachable to said unitary member on one side of the desired point of severance;

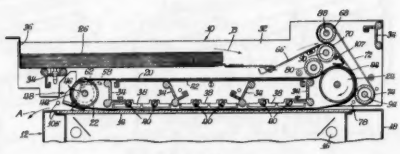
a second clamp element attachable to said unitary member on the other side of said point of severance said second clamp element engaging said first clamp element upon attachment of said elements to the unitary member;



selectively engageable means provided on said first and second clamping elements for rigidly connecting said first clamp element to said second clamp element prior to severance of said unitary member; and

means provided on one of said clamp elements for disengaging said connecting means thereby disconnecting said first and second clamp elements.

3,863,912
DOCUMENT FEEDER
Roy D. Korff, Elk Grove Village, Ill., assignor to Addressograph-Multigraph Corporation, Mount Prospect, Ill.
Continuation of Ser. No. 201,043, Nov. 22, 1971, abandoned.
This application Aug. 3, 1973, Ser. No. 385,370
Int. Cl. B65h *5/02*
U.S. Cl. 271—245 **9 Claims**



1. In a document feeder for transferring documents placed in a stack, one at a time, in succession into a copy position on a platen of a copy machine, an improvement comprising:

support rollers in spaced apart relation;

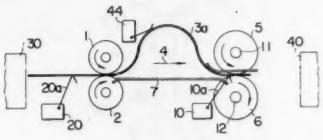
an endless belt supported by said support rollers having a run parallel to the surface of said platen for moving a document through a path across the platen into said copy position;

drive means connected to continuously propel one of said support rollers;

gate means supported about an axis of rotation of one of said support rollers for blocking said path of a document; and

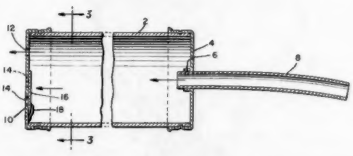
a stop surface movable by pivoting said gate means between a stop position between one of said support rollers and said platen and an open position away from said platen, wherein the end of a document moved into said copy position is engageable by said stop surface in said stop position for aligning and holding said document.

3,863,913
APPARATUS FOR CONVEYING SHEETS
Van Hirafuji, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan
Filed Oct. 19, 1973, Ser. No. 407,833
Claims priority, application Japan, Oct. 25, 1972, 47-106841
Int. Cl. B65h *5/06, 29/20*
U.S. Cl. 271—265 **8 Claims**



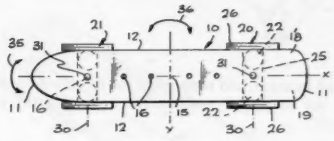
1. An apparatus for conveying sheets comprising:
a. first sheet feed means for feeding a sheet at a first speed;
b. second sheet feed means for receiving said sheet from said first sheet feed means and feeding the sheet at a second speed which is greater than the sheet feeding speed of the first sheet feed means; and
c. control means for maintaining the second sheet feed means inoperative until the leading end of the sheet fed by the first sheet feed means reaches the second sheet feed means, and momentarily operating the second sheet feed means for a short period of time when the leading end of the sheet has reached the second sheet feed means, and for operating the second sheet feed means at the second speed when a loop formed in the sheet between the first and second sheet feed means has grown to a given size subsequent to the termination of the momentary operation of the second sheet feed means.

3,863,914
BREATHING DEVICE
Michael J. O'Connor, 117 Maple Rd., Bala Cynwyd, Pa. 19004
Continuation-in-part of Ser. No. 166,904, July 28, 1971, abandoned. This application Jan. 4, 1973, Ser. No. 321,066
Int. Cl. A61h *31/00*
U.S. Cl. 272—57 F **19 Claims**



1. A breathing device through which an individual can repeat both the inhaling and exhaling phases of respiration comprising: (A) a closed container having a free volume of at least about 500 cc; (B) passageway means through which air can be inhaled from said container and exhaled into said container by the individual; (C) air passage means communicating with an air supply at about atmospheric pressure through which air is admitted into said container and into and through said passageway means when air is inhaled from said container through said passageway means and through which air is expelled from said container when air is exhaled through said passageway means into said container; (D) means responsive to the individual's respiration for increasing the exhalation force needed to expel air from said container relative to the inspiratory force needed to inhale air into the container; and (E) means responsive to the individual's respiration for increasing the exhalation force needed to expel air from said container relative to the exhalation force that would be needed to expel air directly into the atmosphere; wherein the positional relationship of said passageway means and said air passage means is such that at the end of exhalation the container is filled predominately with exhaled air which upon inhalation is first inhaled from said container through said passageway means.

3,863,915
SURFING SIMULATOR
Harry J. Pifer, P. O. Box 117, Kalispell, Mont. 59901
Filed Sept. 10, 1973, Ser. No. 395,743
Int. Cl. A63b *69/18*
U.S. Cl. 272—57 B **2 Claims**

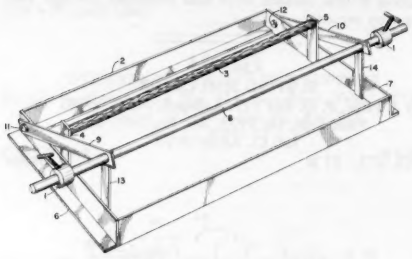


1. A surfing simulator comprising:
an elongated board having top and bottom sides and defining a longitudinal axis in a plane parallel to said sides;
spring suspension means including first and second spring assemblies, each assembly including at least one coil spring and top and bottom members with the spring connected therebetween, with the spring axis extending between said members; and
connecting means for selectively connecting each assembly to the board by securing the assembly top member to the board's bottom side with the spring's axis perpendicular to said longitudinal axis, whereby said springs suspend said board above a support surface with which the bottom members of said assemblies are in contact, with the rockability of said board about an axis perpendicular to said longitudinal axis being a function of the spacing between said assemblies, each of said assemblies includes first and second coil springs spaced apart and parallel between the top and bottom members of the assembly, each assembly defines a plane in which the axes of the springs of the assembly lie, and said connecting means connect each assembly to said board at a selectable angular orientation of the assembly's plane with respect to the board's longitudinal axis so as to control the rockability of the board about said longitudinal axis, the top member of each assembly defining an aperture equidistant from the two springs of the assembly, said board defining a plurality of apertures along its longitudinal axis, and said connecting means include a pair of bolts, extending through one of said board apertures and the aperture of the top member of one assembly, with the rockability of the board about an axis perpendicular to its longitudinal axis being a function of the distance between the board's apertures through which the bolts extend.

3,863,916
EXERCISING DEVICES
Vance Allen Cline, 4831 N. Karlov, Chicago, Ill. 60630
Filed Dec. 17, 1973, Ser. No. 425,211
Int. Cl. A63b *13/00, 21/00*
U.S. Cl. 272—81 **3 Claims**

1. In combination an exercising device comprising a rectangularly constructed frame, including a foot heel rest assembly, consisting of a knurled shaft member secured to and supported by a pair of vertically disposed upstanding members secured adjacent the sides of two opposing transverse frame members, a weight holding bar assembly consisting of a shaft member, including a pair of screw clamp weight collars, secured to a pair of opposing swing arm members, which are pivotal adjacent to the sides, at one end of the two forementioned opposing frame members, a pair of weight bar stops

consisting of two vertically disposed upstanding members, secured adjacent to the sides of said opposing frame members,



positioned beneath, and supporting the forementioned weight holding bar in proper position for beginning the exercise movement.

3,863,917
HOCKEY TRAINING STICK

Robert G. Beale, 7377 Brucy St., St. Leonard, Quebec, Canada

Filed Nov. 19, 1973, Ser. No. 417,196
Claims priority, application Canada, Nov. 17, 1972, 156,903
Int. Cl. A63b *59/14*
U.S. Cl. 273—1 B **8 Claims**

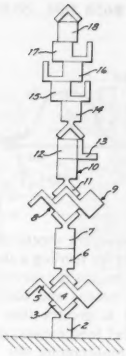
1. Hockey equipment for practicing puck control comprising a hockey stick having a blade, a hockey puck, and flexible tie means connected to the puck, the blade of the stick having a plurality of spaced-apart locations for selectively receiving the tie means whereby the puck will return to a different portion of the blade depending on the location on the blade at which the tie means is received.

3,863,918
BUILDING BLOCK GAME

George A. Kramer, Box 2000, Apple Valley, Calif. 92307

Filed Dec. 10, 1973, Ser. No. 423,249
Int. Cl. A63f *9/00*; **A63h** *33/06*
U.S. Cl. 273—1 R **3 Claims**

1. A building block game in which the blocks comprising the same are adapted to be stacked laterally to define a column in which a portion of the blocks interlock and extend transversely therefrom, said game comprising: a plurality of rectangular blocks in which a first portion thereof includes V-shaped wings that extends outwardly from flat surfaces thereof, a second portion of said blocks that include inverted L-shaped members that project from flat surfaces thereof and are partially offset from said blocks, a third portion of said blocks that include inverted L-shaped members that project from flat surfaces thereof and are axially aligned with said blocks, and a fourth portion of said blocks that include L-shaped members in abutting contact flat surfaces thereof, with one of said blocks of said first portion serving as a base for said column with said V-shaped wing in upwardly extending position and said blocks defining said first, second, third and fourth portions being stacked one upon the other to rest on said V-shaped wings to define said column and at least a part

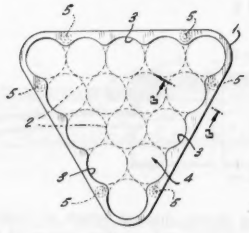


of said first, second, third and fourth portions of said blocks stacked on said V-shaped wing of said block that serves as a base interlocking with one another to extend horizontally from said column.

3,863,919
BILLIARD BALL RACK

Jerry Louis Sardelli, 141 Clearwater, Lindenhurst, N.Y. 11757

Filed May 3, 1973, Ser. No. 357,031
Int. Cl. A63d *15/00*
U.S. Cl. 273—22 **1 Claim**



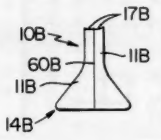
1. In combination, a group of billiard balls and a rack comprised of a flat, rigid frame having an overall triangular shape for the alignment of billiard balls on a billiard playing surface; supporting members depending from said frame to maintain said frame at a distance above the playing surface generally corresponding to the radius of the billiard balls; an interior opening in said frame of substantially triangular shape provided with indentations on the periphery thereof comprising 12 segmented circular portions which mate with the periphery of the billiard balls thereby accomodating 15 billiard balls within said interior opening; the sides of said frame being substantially equal in length to five times the major diameter of one of the billiard balls; and said frame being constructed in a generally equilateral triangular configuration.

3,863,920

BASEBALL AND SOFTBALL TYPE BALL TEE

Joseph V. Tassone, 2425 Rawnsdale Rd., Kettering 45440, and James T. Candor, 5440 Cynthia Ln., Washington Township, Montgomery County 45429, both of Ohio

Filed Jan. 2, 1973, Ser. No. 320,280
Int. Cl. A63b 69/40
U.S. Cl. 273—25 10 Claims



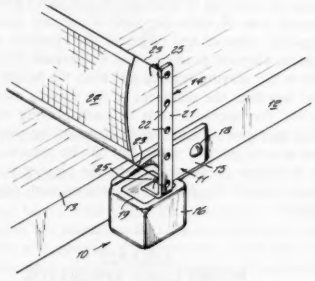
1. A baseball and softball ball tee construction having a base for supporting said construction in an upright manner and having a ball support for supporting thereon a ball having an external diameter within the range of the diameter of a standard baseball to the diameter of a standard softball, said ball support being sized and shaped such that said ball overhangs same at all supporting locations enabling easy striking in a generally upwardly direction from said base by a batter and in any direction about the entire periphery of said tee construction and at a vertical height above said base in a ball strike zone which is at least equal to a vertical height defined by the batter's knees, at least the major part of said base automatically collapsing into a substantially flat configuration by its own weight when said tee construction is overturned.

3,863,921

PLASTIC TABLE TENNIS NET BRACKET

O. R. Price, 905 6th St., Bristol, Tenn. 37620

Filed Nov. 27, 1973, Ser. No. 419,413
Int. Cl. A63b 61/00
U.S. Cl. 273—30 1 Claim



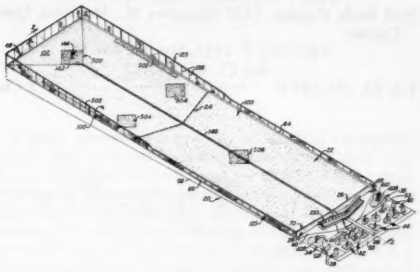
1. In a table tennis net bracket assembly, the combination of a bracket mountable permanently upon a side of a table used for playing table tennis, and said bracket supporting a removeable post, said bracket including a plate portion and a block portion integrally formed together, said plate portion having a pair of openings therethrough for receiving mounting screws in order to secure the same to said table, and said block portion having a vertical opening therethrough, said vertical opening being cross sectionally square, said post being comprised of a correspondingly shaped block receivable within said cross sectionally square opening of said block portion, and a metal bar secured to said block, said block of said post being downwardly convergingly tapered, and said opening of said block portion being downwardly tapered convergingly so that said post is rigidly supported by said bracket, said metal bar having its lower end embedded within said block, said bar extending upwardly and having a plurality of openings therethrough to which an upper and lower cord of a net is attachable.

3,863,922

GOLF PRACTICE RANGE AND METHOD OF RETRIEVING BALLS HIT THEREON

Maurice E. Peeples, Boone St, Royal Heights, Ga. 31548

Division of Ser. No. 82,559, Oct. 21, 1970, Pat. No. 3,738,664. This application Apr. 2, 1973, Ser. No. 346,917
Int. Cl. A63b 69/36
U.S. Cl. 273—35 B 3 Claims



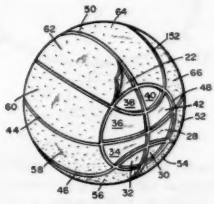
1. A method of retrieving golf balls from random locations on a golf practice range having a shallow V cross-section surface, the range having a ball collection station near one end thereof, the method comprising propelling a flexible drag assembly over the surface of the range longitudinally in one direction and toward the ball collection station and with the flexible drag assembly spanning substantially the full width of the range during its movement, restraining and guiding the opposite ends and the center of the flexible drag assembly during its movement over the range so that the assembly will be held in contact for its full length with the shallow V cross-section surface, thereby assuring engagement of the golf balls by the flexible drag assembly and the sweeping of the golf balls toward the collection station, and then delivering the golf balls by gravity near said one end of the range to the ball collection station.

3,863,923

INFLATED GAME BALL

John W. Anderson, Cincinnati, Ohio, assignor to Hutch Sporting Goods, Inc., Cincinnati, Ohio

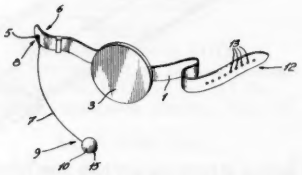
Filed May 14, 1973, Ser. No. 359,979
Int. Cl. A63b 37/12, 41/08
U.S. Cl. 273—58 BA 3 Claims



1. An inflatable game ball comprising an inflatable bladder having a plurality of upstanding ribs thereon defining a plurality of side panel receiving depressions therebetween at the sides of the ball and a plurality of separate end panel receiving depressions at the opposite ends of the ball, said ribs including

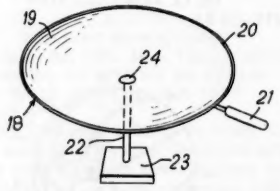
a rib at each end of the ball extending in a circular path and defining closed circular areas at each of the ends of the ball, and further ribs subdividing said circular areas into a plurality of smaller end panel receiving depressions, a plurality of side cover panels secured in said side panel receiving depressions, said side panels all terminating at their opposite ends at said ribs defining the circular areas, and said end panel receiving depressions being devoid of end cover panels whereby desired end panels may be subsequently secured in the end panel receiving depressions to economically produce a ball having a desired appearance.

3,863,924
WAIST TETHERED BALL & TARGET
Paul Emile Gagnon, 2437 Monsabre St., Montreal, Quebec, Canada
Filed Oct. 9, 1973, Ser. No. 404,153
Int. Cl. A63b 71/02
U.S. Cl. 273—97 R **5 Claims**



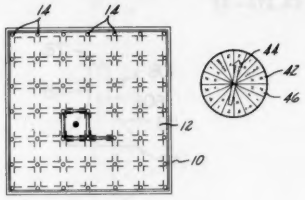
1. A ball game comprising:
a support means adjustable to different human torso sizes and adapted to be placed around a torso;
a generally flat-faced target secured to said support means to lie generally flat against one side of the torso;
a ball and a flexible band, said flexible band being secured at one extremity to said ball, and at the other extremity to said support means at a position spaced from said target around said torso to enable said ball to strike said target by hip motion of the participant.

3,863,925
WHIPTOP GAME
Abraham M. Torgow, 185 E. 206 St., Bronx, N.Y. 10458
Continuation-in-part of Ser. No. 257,276, May 26, 1972, abandoned. This application Mar. 16, 1973, Ser. No. 341,862
Int. Cl. A63f 9/16
U.S. Cl. 273—110 **4 Claims**



1. Apparatus for playing a game comprising in combination, a spinnable conical top having a pointed lower end, a whip comprising a relatively stiff handle, a relatively flexible lash and an orientable game board having an edge and including a smooth concave top playing surface adapted to receive said spinnable top thereon, and means for pivotally support the game board for universal tilting movement of the board, a handle attached to said game board and projecting outwardly beyond said edge for tilting said board.

3,863,926
GAME APPARATUS
Beverly A. White, and David L. White, both of Mason Ct., Westland, Mich. 48185
Filed Sept. 8, 1972, Ser. No. 287,474
Int. Cl. A63f 3/00
U.S. Cl. 273—130 F **7 Claims**

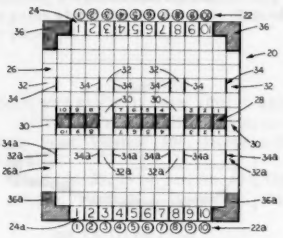


1. Game apparatus comprising:
a game board having a generally flat playing surface;
a plurality of equally spaced, parallel rows of pegs fixedly mounted on the playing surface, each row having a plurality of pegs spaced apart a distance equal to the distance between adjacent rows, each peg in each row being disposed adjacent a peg in an adjacent row in a direction at right angles to the rows of pegs, each of said pegs having a predetermined height above the surface of the board;
at least four similarly shaped elongated playing elements each having a length less than the distance between adjacent pegs; and
wall means mounted on the board for defining at least two playing element positions adjacent each peg including a first playing element position between such peg and the adjacent peg in the row thereof for receiving a playing element parallel to said rows of pegs, and a second playing element position for receiving a playing element between such peg and the adjacent peg in the adjacent row at right angles to said rows of pegs, said wall means being disposed adjacent to their respective pegs, but in spaced relationship thereto, and including a first pair of walls disposed in parallel relationship on opposite sides of and adjacent one end of each playing element position, and a second pair of walls disposed in parallel relationship on opposite sides of and adjacent the opposite end of each playing element position, said wall means having a height above the playing surface less than the height of the pegs and less than the diameter of the playing elements,
whereby the opposite ends of each playing element in a playing element position is disposed between said first and second pairs of walls, but can be removed therefrom by a motion perpendicular to the playing surface of the game board by having its mid-section engaged by a player.

3,863,927
BOARD GAME APPARATUS
Edward M. Moritz, 2710 Hartford Rd., York, Pa. 17402
Filed Jan. 10, 1974, Ser. No. 432,406
Int. Cl. A63f 3/02
U.S. Cl. 273—131 K **3 Claims**

1. A game comprising in combination, a rectangular playing board having an overall grid pattern of playing position squares with the opposite ends of said board having rows of starting position squares consecutively numbered transversely, sets of game pieces for each of two players, said sets of game pieces being visually distinguishable from each other but similarly and consecutively numbered to correspond to the numbering of said starting position squares, a row of scoring squares parallel to and midway between said rows of starting position squares, said row of scoring squares being arranged in a plurality of separated groups of squares to provide

channel passages for said game pieces to be moved between said groups, transverse sets of rows of consecutive numbers along said scoring squares for the respective players being farthest from the rows of starting squares of said players,



whereby it is necessary for the players to move their game pieces through said channel passages and onto the scoring square corresponding to the number on the game piece being moved.

3,863,928

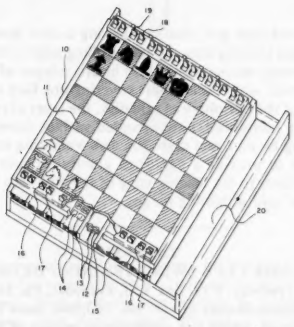
CHESSBOARD AND PROGRAMMED PLAYING AID

James E. Nelson, 304 Harvard Ave., Wenonah, N.J. 08090

Filed July 22, 1974, Ser. No. 490,332

Int. Cl. A63f *3/02*

U.S. Cl. 273—136 B **7 Claims**



1. A chess board and programmed playing aid assembly comprising,

eight sets of display file cards, one set for each file on the chess board, wherein each card displays the entire file of the chess board with chess piece symbols showing the positions of the pieces on that file at a particular stage of the game, and wherein the uppermost cards of the eight sets make up a complete configuration of a chessboard with pieces in play,

move indicia on each display card indicating the color of the piece involved in the next move and the move number of the move,

wherein each set of display cards are organized in a program such that when stacked, the display card directly beneath the top card shows the arrival position of the chess pieces or the removal of a piece according to the programmed move of a chessman of that rank,

guide and holding means to allow a set of the display file cards to be held in position as a stack on the file of the chessboard to which that set is programmed and to allow singular removal of the top display card to expose the card directly under it without removing the entire stack, and

move indicia covering means to prevent general viewing of the move indicia but allow selective uncovering of a single file move indicia.

3,863,929

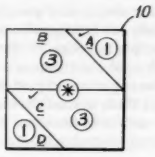
GAME UTILIZING A PLURALITY OF TILES

Steven J. Kahan, 32-45 88th St., Jackson Heights, N.Y. 11369

Filed Jan. 28, 1974, Ser. No. 436,893

Int. Cl. A63f *9/20*

U.S. Cl. 273—137 C **4 Claims**



1. A game comprising a plurality of identical rectangular polygonal tiles, each tile including a plurality of areas with each area of a given tile both being the same and different in size from areas on other tiles, each area having a value number assigned to it, with each area including at least one edge coincident with a tile edge, the length of the area edge being equal to L/N where L is the length of the tile edge and N is a positive integer the lowest value of which is one, each area of each tile being shaped so that a predetermined number of isosceles right triangles can be fit wherein with the leg length of each isosceles right triangle being equal to half the length of a tile edge, the value number of each area being equal to the number of isosceles right triangles that fit into said area, certain areas on a tile being visually distinguishable in a first way in a manner other than shape and value number from adjacent areas of said tile and said adjacent areas being visually distinguishable in a second way in a manner other than shape and value number from said adjacent areas of said tile, and for each tile edge of a given area and the portions of areas at said given tile edge there being a tile edge of another tile with the portions of the areas at said another tile edge being identical to said area portion at said given tile edge whereby in one aspect of the game an edge of a first tile can be matched to an edge of a second tile with the portions of the areas of said first tile at said first tile edge being visually identical to the portions of the area of said second tile at said second tile edge so that on adjacent tiles on a continuous string of identically distinguished areas can be formed.

3,863,930

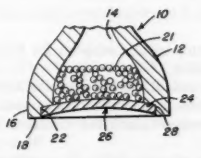
WEIGHTED CHESS PIECE

Joseph R. Uvanni, 722 Laurel St., Rome, N.Y. 13440

Filed Mar. 22, 1974, Ser. No. 453,882

Int. Cl. A63f *3/02*

U.S. Cl. 273—137 W **2 Claims**



1. A game piece, said game piece comprising an upstanding body configured to define a chess piece and having a base portion, said base portion having a game board engaging flat lower support surface, an internal chamber within said body,

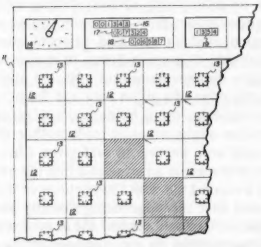
an access port through said lower support surface into said chamber for the introduction of loose ballast into said chamber, and a closure insert for said port, said insert being circular, flat and resiliently flexible for deformation into a concavo-convex configuration within said port, said insert having upper and lower surfaces with a peripheral edge at an angle of slightly less than ninety degrees to the lower surface, said port including a circular side wall projecting inwardly from the lower support surface at an angle thereto slightly greater than the angle of the peripheral insert edge to the insert lower surface, the diameter defined by the peripheral sidewall of the port being slightly less than that of the lower surface of the insert, and a shoulder above said peripheral sidewall of the port projecting radially inward therefrom at an angle equal to the angle of the peripheral edge of the insert to the lower surface of the insert, said insert, upon a concavo-convex deforming insertion thereof into said port, having the peripheral edge thereof engaged flush against the circular sidewall of the port with the upper surface of the insert engaging flush against the inwardly projecting port shoulder.

3,863,931

ELECTRICAL CROSSWORD PUZZLE

Brian R. Forsyth, 8105 Camino Del Sol, La Jolla, Calif. 92037, and Corey D. Rand, 8555 Sherwood Dr., West Hollywood, Calif. 90069

Filed Aug. 24, 1973, Ser. No. 391,335
Int. Cl. A63f *9/18*
U.S. Cl. 273—156 **3 Claims**



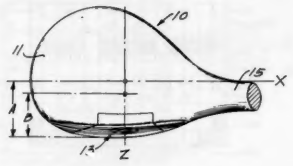
1. An electrical crossword puzzle comprising:
a game board;
a plurality of letter squares arranged in horizontal and vertical arrays to form horizontal and vertical word units on said game board;
a plurality of coded electrical contacts on each of said letter squares;
a plurality of letter blocks adapted for being received on said letter squares;
a plurality of electrical contacts on said letter blocks geometrically disposed and coded for cooperation with said plurality of coded electrical contacts on said letter squares; and
electrical scoring means coupled to said electrical contacts on said letter squares, said scoring means including a counting means for indicating the number of completed correct horizontal word units and counting means operable for indicating the number of completed correct vertical word units.

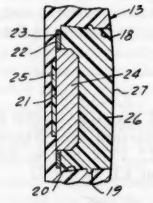
3,863,932

WEIGHTED WOOD GOLF CLUB

Arthur J. Lezatte, Downers Grove, Ill., assignor to Wilson Sporting Goods Co., River Grove, Ill.

Filed May 21, 1973, Ser. No. 362,004
Int. Cl. A63b *53/04*
U.S. Cl. 273—169 **7 Claims**





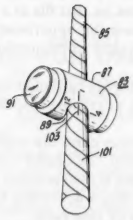
1. A wood-type golf club comprising a club head having a recess in the striking area, an insert filling said recess, a dense disk weighting means within said insert, a layer of an impact resistant resin within said insert covering one face and at least a portion of the periphery of said disk, the layer of resin having a smoothly contoured, uninterrupted surface forming part of the striking face of said club, the disk weighting means being positioned to provide a center of gravity for said club head which is closer to the leading edge of the club face than in the absence of said weighting means.

3,863,933

GAME CLUB SWING TRAINING DEVICE

Wynn B. Tredway, P.O. Box 130, Freeport, Pa. 16229

Continuation-in-part of Ser. No. 263,980, June 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 153,772, June 16, 1971, abandoned. This application June 11, 1973, Ser. No. 368,814
Int. Cl. A63b *69/36*
U.S. Cl. 273—186 A **7 Claims**



1. Apparatus for use in a club swing training program comprising:
a club shaft;
a light having indicia thereon;

means for adjustably mounting said light to said shaft;
an index on said shaft; and
means for aligning selected ones of said indicia with said index whereby, when said shaft is swung properly during said training program, said light emits rays along preselected paths which may be viewed to permit a close study of the phases of a club swing.

3,863,934

DISMOUNTABLE COLUMN APPLICABLE TO AUTOMATIC RECORD PLAYERS

Raul Antonio Vega, Vieytes 1386, Martinez-Pcia., Buenos Aires, Argentina

Filed Jan. 29, 1974, Ser. No. 437,625
Claims priority, application Argentina, Feb. 9, 1973, 246523
Int. Cl. G11b *17/04, 17/16*
U.S. Cl. 274—10 S **1 Claim**

1. A dismountable column within a hollow shaft attachable to the base of a record player, said column having on a portion entering said shaft and on said portion a pyramid-shaped protuberance, said hollow shaft having a vertical groove within which is guided said protuberance and a ring-shaped groove positioned above said protuberance when the column is inserted fully within the shaft, and an elastic ring having an opening, the thickness of said ring being coincident with the width of the ring-shaped groove and having an interior coincident with the bottom of the ring-shaped groove when riding within said groove, said ring having a small interior tongue positioned opposite the opening to fit within the vertical groove and having a length not exceeding the thickness of the wall of the tubular shaft but of a length sufficient to engage said protuberance as said column is mounted or dismounted.

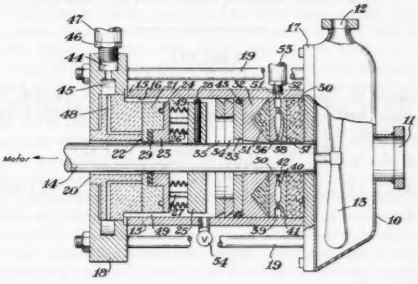
3,863,935

SEAL ASSEMBLY AND LUBRICATION SYSTEM IN A PUMP FOR HANDLING LIQUID MATERIALS

Marvin L. Batch, 2106 Wilmington, Midland, Mich. 48640

Filed Jan. 9, 1974, Ser. No. 431,897
Int. Cl. F16j *15/16, 15/40, 15/44*
U.S. Cl. 277—65 **4 Claims**

1. An improved seal assembly and lubrication system for use in a pump for handling liquid materials, the pump including a rotatable shaft positioned in a packing gland chamber which has an inner wall surface, the improvement comprising the combination of:
a gland ring which defines one end of the chamber;
a pump head housing which defines the opposite end of the packing gland chamber;
a first lubrication receiving port which is positioned in the gland ring, and is adapted for receiving a lubrication material;
a first lubrication channel which is defined in the gland ring, which communicates with the first lubrication port, and which is adapted to receive the said lubricant material from the first lubrication port;
a rear seal assembly in which the components enclose the shaft, the components are spaced from the inner wall surface of the packing gland, the components include an insert block that seats in the gland ring and a face block that mates with the insert block to define a seal face;
a series of first lubrication passages which extend through the insert block, which connect the first lubrication channel with the seal face, and which are adapted to carry the said lubricant material from the first lubrication channel to the seal face;



a forward seal assembly in which the components enclose the rotatable shaft, the components are spaced from the rear seal assembly and from the shaft, the components are positioned adjacent to the pump head housing, and one component of the seal assembly is a lubrication feeder member;
a second lubrication receiving port which is positioned in the wall of the packing gland chamber, and is adapted for receiving a lubrication material;
a second lubrication channel which is defined in the lubrication feeder member, which communicates with the second lubrication receiving port, and which is adapted to receive the said lubricant material from the second lubrication port;
a series of second lubrication passages which are defined in the lubrication feeder member, which connect the second lubrication channel with the space defined between the forward seal assembly and the shaft, and which are adapted to carry the said lubricant material from the second lubrication channel to the shaft.

3,863,936

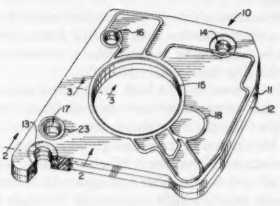
HIGH TEMPERATURE GASKET STRUCTURE AND METHOD OF PRODUCING SAME

Robert G. Farnam, New Lisbon, and Michael T. Passarella, Wisconsin Rapids, both of Wis., assignors to F. D. Farnum Co., St. Lyons, Ill.

Filed Mar. 27, 1973, Ser. No. 345,356
Int. Cl. F16j *15/12*
U.S. Cl. 277—166 **18 Claims**

1. A high temperature gasket comprising:
a. a body portion formed of semi-rigid asbestos board having minimal elastomeric binder content and having a density within the range of 65 to 100 lb/ft^3, and

b. a bolt hole portion integral with the body portion, but having a density from 25 percent to 250 percent higher



than that of the surrounding body portion, and including a metal washer retained within such bolt hole portion.

3,863,937
ADAPTER GASKET

Howard M. Silverman, Edison, and Herbert M. Laford, Verona, both of N.J., assignors to Electro-Protective Corp., Newark, N.J.

Filed Nov. 2, 1973, Ser. No. 412,323
Int. Cl. F16j *15/10;* **F16l** *5/00*
U.S. Cl. 277—180 **12 Claims**

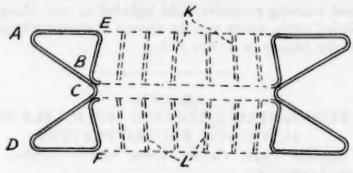
1. A gasket for mounting pipes in pipe saddles, said gasket comprising an arcuate gasket body, said arcuate gasket body including an outer cylindrical surface of a first diameter, and said arcuate gasket body including an inner cylindrical surface of a second diameter, said second diameter being smaller than said first diameter.

3,863,938
SEALING MEANS

Terence Peter Nicholson, County Durham nr. Consett, England, assignor to The Corrugated Packing and Sheet Metal Company Limited, Newcastle upon Tyne, England

Filed Feb. 2, 1973, Ser. No. 329,137
Claims priority, application Great Britain, Sept. 27, 1971, 44907/71
Int. Cl. F16j *15/08*
U.S. Cl. 277—200 **4 Claims**

1. Sealing means comprising a ring of resilient material which is substantially sigma-shaped in cross-section, having a pair of outer arms and a pair of intermediate arms, the free ends of the outer arms being in-turned to define rim portions

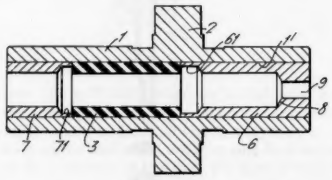


in turn having free ends resting on the adjacent intermediate members.

3,863,939
CHUCK FOR USE IN A DENTAL HANDPIECE

Kenzo Sato, Kyoto, Japan, assignor to Kabushika Kaisha Morita Seisakusho, Kyoto, Japan

Filed Aug. 17, 1973, Ser. No. 389,374
Claims priority, application Japan, Aug. 31, 1972, 47-87426
Int. Cl. B23b *31/08*
U.S. Cl. 279—1 SG **4 Claims**



1. A chuck for use in a dental handpiece having therein a rotor provided with an axial through bore, comprising a tubular body provided in said axial bore and fixed to the inner surface thereof for simultaneous rotation with said rotor, said tubular body being made of an elastic material and having along its whole length an inner diameter such that when said tool bar is inserted into said tubular body, said tubular body is deformed and compressed along its whole length so that the elasticity of the material of said tubular body produces a sufficient gripping force of said tubular body on said tool bar; and at least one tubular fixing member provided adjacent to said tubular body in said axial bore of said rotor and secured to the inner surface thereof, said fixing member being made of metal and having an inner diameter such that the inner surface of said tubular fixing member restricts the nutation of said dental tool inserted therethrough as it is being rotated, said fixing member provided at the end of said chuck adjacent to one end of said tubular body with an annular recess having an inner diameter greater than the inner diameter of said tubular body so that part of the material of said deformed tubular body protrudes into said annular recess.

3,863,940
WIDE OPENING COLLET

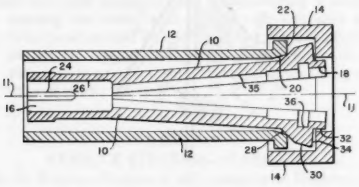
Philip T. Cummings, 8924 Lindblade, Culver City, Calif.

Filed Apr. 4, 1973, Ser. No. 347,782
Int. Cl. B23b *31/20*
U.S. Cl. 279—50 **8 Claims**

1. A spring leaf collet having a longitudinal axis comprising:
a plurality of resilient leaves mutually attached at one end of said collet and separated at the other end;
a first annular cam surface on each of said leaves adjacent the other end of said collet, said surface being formed at

a predetermined angle with respect to the longitudinal axis of the collet;

a second annular cam surface adjacent said first cam surface and at a substantially larger angle than said first surface with respect to said longitudinal axis;



a third cam surface adjacent said second cam surface, said third surface being formed at a lower angle than said second surface with respect to the longitudinal axis and forming an annular conical surface of smaller diameter than the surface formed by said second surface; and

said third surface being formed at generally the same angle as said first surface.

3,863,941

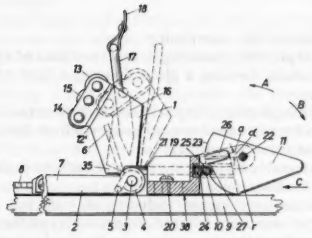
DEVICE FOR USE WITH SKI BINDINGS FOR SELECTIVELY RETAINING BINDING MEMBERS WHICH CAN BE LIFTED FROM THE SKI

Andreas Hausleithner, Mittenwald, Germany, assignor to Heinrich Wunder, Dachau, Germany

Filed Aug. 3, 1973, Ser. No. 385,233

Int. Cl. A63c 9/10

U.S. Cl. 280—11.35 E **4 Claims**



1. In a ski binding comprising a holding-down member for the heel of the boot, which member is adapted to be lifted from the ski, the improvement comprising a housing which is secured to the ski adjacent to that end of said holding-down member which faces the rear end of the ski, a locking member in the form of a U-shaped member which is mounted in the housing for a displacement in the longitudinal axis of the ski under the influence of a spring, which urges said locking member away from the holding-down member, and means for moving the locking member against the force of said spring and for fixing said locking member in a position to hold the holding-down member against the ski, said moving means including a lever connected to displace the locking member and pivoted in said housing on an axis which is transverse to the skiing direction, said lever having a slot which is downwardly inclined toward the heel of the boot, and a recess which is disposed below said slot to receive the web of the said U-shaped member.

3,863,942

SKI BINDING

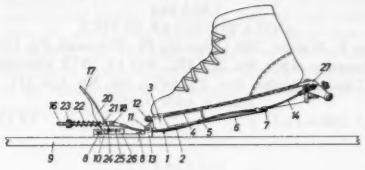
Simon Burger, Dachau, Germany, assignor to Heinrich Wunder KG, Dachau, Germany

Filed Aug. 13, 1973, Ser. No. 387,658

Claims priority, application Austria, Aug. 16, 1972, 7050/72

Int. Cl. A63c 9/083

U.S. Cl. 280—11.35 A **7 Claims**



1. A ski binding for detachably securing a ski to a skiing boot, comprising a sole plate having a surface for supporting the boot, means for pivotally connecting the sole plate to the ski adjacent to the toe portion of the boot about an axis which is transverse to the longitudinal direction of the ski, said sole plate being provided with means adapted to hold the toe portion of the boot on the sole plate and to follow the movement of the toe portion of the boot about said transverse axis, a flexible cable which is detachably secured with respect to the ski in front of said sole plate and extends on the sides of said sole plate rearwardly and around the heel portion of the boot, a notched bar, which is disposed in front of said sole plate and extends along the longitudinal center line and serves for a detachable fixation of said cable, means provided on said cable and adapted to be hooked into notches of said notched bar, said notched bar forming part of a base, which is adapted to be secured to said ski and carries said means for pivotally connecting said sole plate, said notched bar having notches which are downwardly inclined toward the toe portion of the boot and said cable being hooked into said bar by means of a tightener which has laterally protruding pins adapted to be inserted into said notches, said cable being pivoted to a screw of the tightener and said screw being pivoted to a tightener lever at a point spaced from the pivot for the cable toward the toe portion of the boot, said tightener lever carrying said pins for engaging said tightener with the notches of said notched bar.

3,863,943

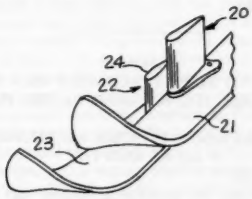
SKI ANTI-CROSSING DEVICE

Hugo V. Giannotti, E. Patchogue, N.Y., assignor to Ski Dynamics Inc., Bellport, N.Y.

Filed Sept. 24, 1973, Ser. No. 400,027

Int. Cl. A63c 11/00

U.S. Cl. 280—11.37 E **5 Claims**



1. Means for attachment to the upper surfaces adjacent an end of skis comprising a first base plate, mounted on a first ski, a first member pivotally mounted on said first base plate,

a second base plate mounted on a second ski, a second member pivotally mounted on said second base plate,

said members being pivoted about an axis parallel to the longitudinal axis of said skis,

said members being spring loaded to the vertical position, each said member being adapted to block the other ski from crossing it but yielding in the direction that will unlock the other ski if the other ski has crossed a member.

3,863,944

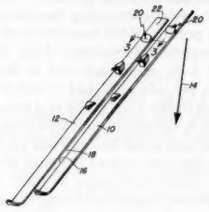
ANTI CROSSOVER DEVICE

Thomas P. Waddel, 309 Columbia Pl., Broomall, Pa. 19008

Continuation of Ser. No. 252,472, May 11, 1972, abandoned. This application Dec. 13, 1973, Ser. No. 424,331

Int. Cl. A63c *5/06*

U.S. Cl. 280—11.37 E **13 Claims**



1. A ski attachment to aid in parallel skiing comprising:

a member having a mounting surface at its bottom and a generally convex upper surface, at least a portion of which extends upwardly and inwardly from adjacent an edge of the ski when attached thereto;

means for adhesively bonding said mounting surface of said member to the upper surface of said ski adjacent an end of said ski so that said upper surface of said member projects upwardly of said ski;

said member being formed from a material which is of a softness and resilience as to enable an edge and portion of the bottom of an adjacent overlapping ski to dig into said member to form a pocket of substantially conforming shape therein, whereby said pocket may resist further overlapping of said skis and may provide a support for said bottom portion of said overlapping ski when a portion of the skier's weight is on said overlapping ski, said member being sufficiently resilient as to urge said overlapping ski out of said pocket toward a non-overlapping position as the skier's weight on said overlapping ski is diminished.

3,863,945

WHEEL UNIT FOR ATTACHMENT TO A TRIPOD

Diane M. Dunstan, 3312 N. Central, No. 203, Phoenix, Ariz. 85012

Filed Sept. 4, 1973, Ser. No. 393,948

Int. Cl. B62b *1/12*

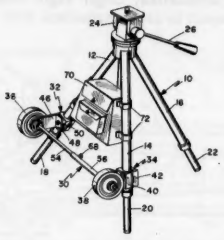
U.S. Cl. 280—35 **4 Claims**

1. A wheel unit for attachment to two legs of a tripod, comprising:

a pair of brackets each having a clamp portion with means for clamping on one of the tripod legs;

an arm extending from each clamp portion, each arm being pivotally adjustable on the clamp portion about an axis substantially radial to the longitudinal axis of the respective tripod leg;

each said arm having a wheel rotatably mounted thereon; and spacing means interconnecting said brackets for holding the brackets and the two tripod legs in spaced apart position.



3,863,946

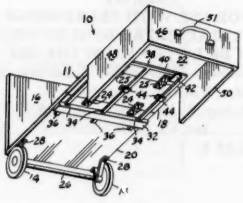
TWO-WHEEL FOLDABLE DOLLY

Barett O. Dotson, 2830 S.E. Colt Dr., Portland, Oreg. 97202

Filed Oct. 29, 1973, Ser. No. 410,924

Int. Cl. B62b *1/10*

U.S. Cl. 280—36 C **2 Claims**



1. A foldable dolly, comprising:

a sectional platform including a center section and opposing end sections forming a plane defining a load receiving surface;

platform hinges connecting said end sections to said center section for movement toward and away from the plane of the load receiving surface;

means releasably maintaining said end sections in the plane of the load receiving surface,

said releaseable means including at least one pair of anchor members secured, respectively, to the surface of each said end section opposite the load receiving surface adjacent the hinged connection with the center section,

each anchor member of said pair of anchor members forming a slot adjacent the surface of said end sections opposite the load receiving surface and,

an elongated anchor bar slidable into and out of the anchor member slots,

the respective end portions of said anchor bar projecting beyond the hinged connection of said center section with said end sections when said anchor bar is disposed within the anchor member slots;

a pair of platform support wheels connected with one said end section opposite the load receiving surface;

a load retaining shoe hingely connected by one marginal edge to the end portion of said one end section opposite said platform hinges for movement toward and away from the load receiving surface;

a pair of side walls coextensive with and respectively connected by one marginal edge to opposing side edges of said end section opposite said shoe,

the planes of said side walls being normal to and projecting away from the plane of the load receiving surface; and,

an end wall extending between said side walls at their ends opposite said shoe and being connected, by one marginal side edge with the end of said one end section opposite said shoe,

said end wall and said side walls forming a socket for nesting the other said end section and said pair of wheels when said end sections are pivoted about their respective hinged connection toward each other and disposed in a plane normal to the load receiving surface of said center section.

3,863,947

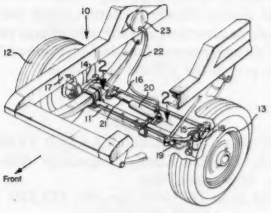
VEHICLE STEERING STABILIZER

Orville O. Weston, Cudahy, Calif., assignor to Highway Safety Accesories Company, Inc., Bell, Calif.

Filed Oct. 9, 1973, Ser. No. 404,412

Int. Cl. B62d *7/00*

U.S. Cl. 280—90 **5 Claims**



1. A steering stabilizer for connection between a front wheel axle and the steering rod of a vehicle comprising, in combination:

a. a cylinder having first and second end caps with central openings;

b. a shaft comprised of first and second sections passing into opposite ends of said cylinder through the central openings in said end caps respectively, the inner end of the first shaft section having a reduced diameter portion defining a first annular shoulder, the inner end of the second shaft section having a counterbore dimensioned to receive the end of said reduced diameter portion to define a second annular shoulder opposing said first annular shoulder in spaced relationship;

c. first and second pistons mounted on said reduced diameter portion between said first and second shoulders in axial alignment with each other, the axial length of the pistons being less than the actual distance between the shoulders so that the pistons can move axially apart to seat respectively on said shoulders in a first position and axially towards each other into face-to-face engagement in a second position,

said pistons including passage means respectively radially spaced different distances from their axes so that the passage means are eclipsed when the pistons are in their second position and are clear when in their first position, said second piston including an annular groove in its face opposed to the face of the first piston within the radial distance of its passage means;

d. biasing means between the opposed faces of said pistons urging them apart to said first position, said biasing means comprising an O-ring in said annular groove, said O-ring being compressed completely into said groove when said pistons are in their second position so that their opposed faces are in full surface contact; and,

e. a liquid filling said cylinder, the volume of liquid displaced in said cylinder by the shaft means and first and second pistons being constant for all axial positions of the shaft means and pistons in said cylinder between said end caps so that said shaft means and pistons can move back and forth in the cylinder to follow normal movements of the steering rod relative to the axle, said liquid passing from one side of the pistons to the other through said passage means and the separation space defined between the pistons when in their first position, any sudden shock applied to the steering rod tending to accelerate relative movement between the shaft means and cylinder in one direction or the other in excess of a given acceleration, causing said pistons to move to their second position to close off said passage means and block liquid flow therethrough so that the shaft means is held in its last axial position to thereby stabilize the steering rod and wheels of the vehicle against unintended sudden movement as a result of said shock.

3,863,948

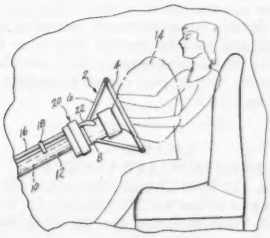
ROTARY CONNECTION FOR A SAFETY BAG INFLATION SYSTEM

Rayburn D. Vancil, Carterville, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 5, 1973, Ser. No. 403,735

Int. Cl. B60r *21/08*

U.S. Cl. 280—150 AB **1 Claim**



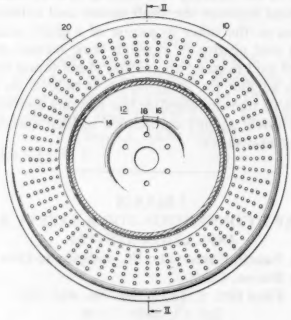
1. A vehicle safety assembly mounted on a steering asembly of the vehicle, said steering assembly including a steering column fixed to the vehicle; a steering shaft rotatably mounted within said steering column; a steering wheel having a longitudinally elongated hub which is fixed to said steering shaft, said hub having a hollow interior; said safety assembly comprising an air bag stored in a collapsed condition within said hub; first conduit means mounted externally of said steering column and fixed thereto for ducting air bag inflation gas; second conduit means mounted externally of said hub, said second conduit means communicating with the interior of said hub through an opening in said hub upstream of said air bag, said second conduit means being fixed to the exterior of said hub and rotatable therewith, and said second conduit means being operable to duct air bag inflation gas into the interior of said hub; and an annular manifold interposed between said first and second conduit means for establishing fluid-ducting connection therebetween, said manifold including a first annular portion fixed to and completely encircling the exterior of said steering column, and a second annular portion fixed to and completely encircling the exterior of said hub and rotatable therewith, said first conduit means opening into said first manifold portion and said second conduit means opening into said second manifold portion; and annular seal means fixed to one of said manifold portions and disposed in sliding sealing engagement with the other of said manifold portions to form a gas-tight seal between said first and second manifold portions.

3,863,949

TIRE SPLASH GUARD

Lloyd Clarke, Block 20-G, Greenhill Dr., Silverhill, CH. CH., Barbados, British W. Indies

Filed May 6, 1974, Ser. No. 467,072
Int. Cl. B62d *25/16*
U.S. Cl. 280—156 **6 Claims**



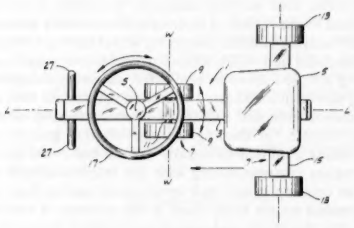
1. A splash guard for motor vehicles wheels comprising an annular member adapted to be secured on the side wall of a tire and having a shape conforming to the shape of said side wall; said member having an inner peripheral portion clamped between said tire and the rim of a wheel; and a plurality of spaced rows of flexible interceptor rods extending from said member; each of said rods having tips bent away from the center of said tire thereby forming a rotary, circular splash shield to downwardly deflect spray caused by contact between said wheels and wet roads.

3,863,950

RIDER-PROPELLED VEHICLE

Gerald J. Jordan, 127 West Chicago, Marceline, Mo. 64658

Continuation-in-part of Ser. No. 271,551, July 13, 1972, Pat. No. 3,807,760. This application Apr. 26, 1974, Ser. No. 464,300
Int. Cl. B62m *1/00*
U.S. Cl. 280—218 **10 Claims**



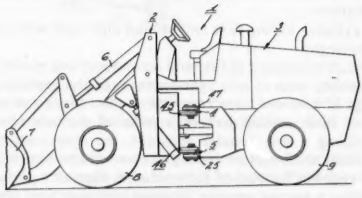
1. A rider-propelled wheeled vehicle comprising:
a frame;
a seat mounted on the frame for supporting the rider;
wheel means for supporting the frame above the ground including an axle mounted for swinging movement midway between its ends relative to the frame on an upright axis, said axis being rotatable 360° about its upright axis, said wheel means including a pair of wheels carried by said swingable axle spaced generally at equal distances on opposite sides of said upright axis with the wheels on a common generally horizontal axis; and
rider operable means for propelling and steering said vehicle including means for swinging said axle about its upright axis and means associated with each wheel carried by said swingable axle permitting rotation thereof in one direction with respect to said axle but preventing rotation thereof in the opposite direction with respect to the axle, said swingable axle being adapted to occupy a first neutral position in which the axis of the wheels is generally perpendicular to the longitudinal axis of the vehicle and the wheels are rotatable so as to permit forward rolling of the vehicle in the direction of its longitudinal axis, said swingable axle being adapted to occupy a second neutral position in which the axis of the wheels is generally perpendicular to the longitudinal axis of the vehicle and the wheels are rotatable so as to permit rearward rolling of the vehicle in the direction of its longitudinal axis, said axle being swingable on said upright axis in opposite directions about its first neutral position for effecting generally forward propulsion of the vehicle via one wheel being held against reverse rotation while the other rotates in forward direction and the axle swings forward on the point of engagement of the held wheel with the ground thereby to propel the vehicle forward, said axle being similarly swingable on said upright axis in opposite directions about its second neutral position for effecting generally rearward propulsion of the vehicle via one wheel being held against forward rotation while the other rotates in reverse direction and the axle swings rearward on the point of engagement of the last-mentioned held wheel thereby to propel the vehicle backwards.

3,863,951

BEARING SEAL FOR ARTICULATED VEHICLE

John W. Barth, Topeka, Kans., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed June 25, 1973, Ser. No. 373,520
Int. Cl. B62d *53/02*
U.S. Cl. 280—400 **10 Claims**



1. An articulated vehicle bearing pivotally connecting first and second sections of an articulated vehicle comprising, a bearing support means on the first of said vehicle sections partially forming a bearing chamber, a pin means, means on the second of said vehicle sections connected to said pin means, a first bushing defining a segment of a spherical surface mounted on said bearing support means, a complementary bushing mounted on said pin means defining a segment of a spherical surface engaging the segment of spherical surface of said first bushing, a flexible seal member including an annular mounting portion resiliently positioned on said pin means and complementary bushing, an axial sealing portion on said seal member biased to sealingly engage said bearing support means and thereby form a sealed bearing compartment for said bushings.

3,863,952

FIFTH WHEEL KING PIN LOCK COMBINATION

Donald W. Hodgson, 1646 10th St., Arcata, Calif. 95521

Filed Dec. 6, 1973, Ser. No. 422,437
Int. Cl. B62d *53/12*
U.S. Cl. 280—434 **6 Claims**

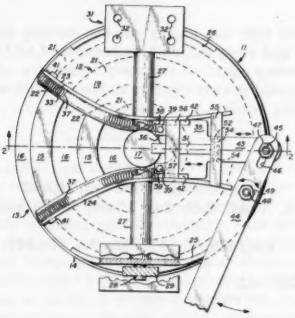
1. In a fifth wheel:

first half means for affixing to a first vehicle and having an opening therein to receive a king pin affixed to a second vehicle to be coupled to the first vehicle, said first half means having structure for receiving said king pin in said opening due to relative vertical translation therebetween for effecting coupling engagement between said king pin and said first half means to restrain relative horizontal translation therebetween;

bolt means for movement into said opening in said first half after the king pin has been received therein for locking the king pin to said first half means against vertical movement;

means for biasing said bolt means into said opening in said first half and into locking engagement with the king pin as received in said opening in said first half;

latch means for preventing the biased return of said bolt means after said bolt means has been withdrawn from locking engagement with the king pin;



trigger means for disposition in a first position for triggering engagement with the king pin upon entry of the king pin into locking position in said opening in said first half means for triggering release of said latch means due to said relative vertical translation and allowing said bias means to move said bolt means into locking engagement with the king pin to lock the king pin to said first half, said trigger means adapted for disposition in a second position for non-triggering engagement with an unlocked but previously locked king pin disposed in the locking position; and

second bias means for biasing said trigger means into said second position of non-triggering engagement with the previously locked king pin after said bolt means has been withdrawn from locking engagement with the king pin and for automatically urging said trigger means into said first triggering position, upon withdrawal of the previously locked king pin, such that said trigger is positioned for triggering engagement with the next king pin to enter the locking position in said opening in said first half means.

3,863,953

INDUSTRIAL TRAILER STEERING MECHANISM

David F. Jorgensen, 1616 Huntington Dr., South Pasadena, Calif. 91030

Filed Oct. 5, 1973, Ser. No. 404,109

Int. Cl. B62d *13/04*

U.S. Cl. 280—444 **19 Claims**

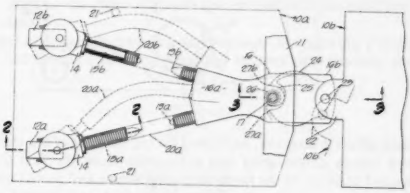
1. A trailer vehicle for coupling connection with a pulling vehicle of a trackless train, comprising:

a. a generally rectangular platform;

b. individually supported wheel assemblies at the rear corners of said platform pivoted for swinging movement on a vertical axis;

c. a pulling tongue at the forward end of said platform pivoted between its forward end and rear end for lateral swinging movements; and

d. means interconnecting the rear end of said tongue respectively with each of the wheel assemblies for imparting



guiding swinging movements thereto in response to lateral pivotal movements of the forward end of said tongue, said means comprising a resilient member extending between the rear end of said tongue and each of said wheel assemblies.

3,863,954

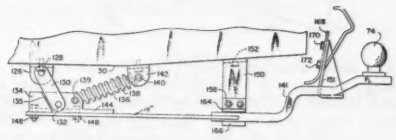
LOAD DAMPING FRAME HITCH FOR VEHICLES TOWING A TRAILER

John C. Abromavage, 1437 E. Westleyan Dr., Tempe, Ariz. 85282, and James W. Ryden, 3143 W. Stella Ln., Phoenix, Ariz. 85017

Division of Ser. No. 384,764, Aug. 1, 1973,. This application June 3, 1974, Ser. No. 476,008

Int. Cl. B60d *1/16*

U.S. Cl. 280—476 **3 Claims**



1. A vehicle frame hitch of the type used for hitching and pulling trailers comprising:

A. a hitch platform movably attached at its forward end to the vehicle frame and slidably supported by brackets extending downwardly from the vehicle frame and bumper;

B. a hitch ball secured to the rear end of said hitch platform;

C. a bumper adapter bracket secured to the vehicle bumper and slidably engaging said hitch platform; and

D. tension means connected between the forward end of said hitch platform and brackets secured to the vehicle frame rearwardly of said forward end.

3,863,955

PICK-UP-TYPE DRAWBAR ASSEMBLY

Ludwig Muncke, Morlenbach; Gerhard Gross, Wiesental, and Josef Buchmuller, Mannheim, all of Germany, assignors to Deere & Company, Moline, Ill.

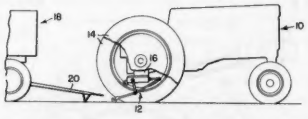
Continuation of Ser. No. 66,977, Aug. 26, 1970, abandoned. This application May 7, 1973, Ser. No. 357,865

Int. Cl. B60d *1/04*

U.S. Cl. 280—479 A **17 Claims**

1. A drawbar assembly in combination with a tractor having a normal direction of travel, comprising: a drawbar extending in the normal direction of travel; vehicle hitch-engaging means carried by said drawbar; connecting means securing said drawbar to said tractor for movement between first and second positions wherein said hitch-engaging means is respectively disposed in a raised towing condition and a lowered

vehicle hitch-engaging condition, said second position being located downwardly and rearwardly from said first position; said connecting means including means for constrainingly guiding said hitch-engaging means along a smooth arcuate



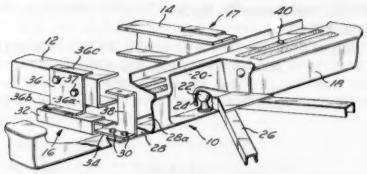
path which is concave, as viewed facing the rear of the tractor, and curves downwardly and rearwardly from the first to the second position of the hitch-engaging means and power means for moving said drawbar between its first and second positions.

3,863,956

SHOCK ABSORBING BUMPER AND HITCH

Shahid R. Khan, Urbana, Ill., assignor to The Scott & Fetzer Company, Cleveland, Ohio

Filed Feb. 28, 1974, Ser. No. 446,600
Int. Cl. B60d *3/00*
U.S. Cl. 280—483 **12 Claims**



1. A shock absorbing bumper unit for trailer hitches comprising a bumper with a towing-connector member fixed at the center thereof, bracket means for mounting said bumper on a vehicle frame, said bumper including draw bar means for transmitting forces between said towing-connector member and said bracket means, said bracket means comprising a pair of female bracket elements fixed to the frame rails at each side of said vehicle frame and a pair of male bracket elements fixed to said draw bar means on each side of said towing-connector member and partially penetrating said female bracket elements, draw rod means tied to each of said female bracket elements and extending from the tie point through the penetrating end of said male bracket element and lengthwise thereof to a rod end provided with sleeve retainer means, first resilient sleeve means surrounding said rod between said tie point and said penetrating end, second resilient sleeve means surrounding said rod between said penetrating end engaging opposite ends of said first and second sleeve means whereby, during the course of towing, the bumper together with the male bracket elements on each side thereof move back and forth with respect to the female bracket elements and the vehicle frame, alternately compressing the first and second resilient sleeve means associated with the bracket means at each side of the bumper.

3,863,957

BOOK SECTION

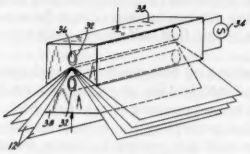
William C. Heller, Jr., 1840 N. Farwell Ave., Milwaukee, Wis. 53202, and Leonard Shatzkin, Croton-On-Hudson, N.Y., assignors to said Heller, by said Shatzkin

Division of Ser. No. 74,270, Sept. 22, 1970, Pat. No. 3,730,805. This application Feb. 26, 1973, Ser. No. 335,486
Int. Cl. B42d *1/00*
U.S. Cl. 281—27 **8 Claims**

1. A book signature comprising:

a plurality of paper leaves having abutting portions containing aligned holes;

a plurality of strands of thread having dispersed therein a gamma Fe_2O_3 particulate susceptor heatable upon exposure to an alternating magnetic field, said strands being



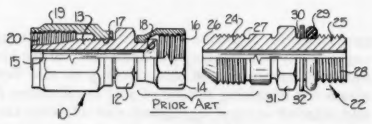
formed into leaf joining stitches running through said holes and along the abutting portions of said leaves; and a bonding agent of thermally responsive adhesiveness fusing said strands together and to adjacent areas of said abutting portions.

3,863,958

UNIVERSAL HOSE COUPLING

William H. Todd, P.O. Box 12488, Winston-Salem, N.C. 27107

Filed May 2, 1973, Ser. No. 356,409
Int. Cl. F16l *25/00*
U.S. Cl. 285—12 **10 Claims**



1. A hose coupling adapted to be fixedly connected to one end of a hydraulic hose or the like and characterized by the ability to sealably receive dissimilar externally threaded male fittings for connecting the coupling and associated hose to various external components, said hose coupling comprising

a nipple comprising a cylindrical stem portion adapted to be inserted into the end of the hose, an integral head portion, and a tubular bore extending coaxially through said stem portion and said head portion, said tubular bore including a first portion extending substantially through said stem portion,

a second internally threaded portion of a diameter larger than said first portion and extending substantially through said head portion,

a frusto-conical portion interconnecting said first portion and said second portion to define a first outwardly facing sealing surface, and

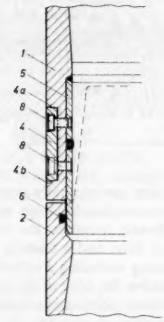
an entry end portion communicating with said second portion and defining a second outwardly facing sealing surface, and

means for securing an end of the hose coaxially about said stem portion, whereby either an externally threaded male fitting having a conically tapered forward end conforming to the taper of said first sealing surface, or an externally threaded male fitting having an external O-ring which is adapted to sealably engage said second sealing surface, may be sealably received in said coupling.

3,863,959
PIPE CONNECTION

Kurt Karl Blaschke, Liesbeth-Dill-Strasse 21, 6602 Dudweiler/Saar, Germany

Filed Mar. 5, 1973, Ser. No. 338,304
Claims priority, application Germany, Mar. 7, 1972, 2210980
Int. Cl. F16l *55/00*
U.S. Cl. 285—24 **7 Claims**



1. A releasable pipe connection for axially and rotationally connecting adjoining pipe sections, such as sections of boring pipe and the like, comprising in combination:

two axially adjoining pipe end portions, each having a plurality of regularly spaced axial teeth with matching axial recesses therebetween for receiving therein the axial teeth of the other pipe end portion, the mating teeth thus defining an axially overlapping portion between the two pipe end portions, the pipe wall in said overlapping portion being thus alternatingly part of one or the other of the two pipe end portions;

an annular groove on the outer side of the pipe wall in said overlapping portion of the two pipe end portions, said groove having a substantially cylindrical bottom surface and outwardly extending axial flanks which are thus alternatingly part of one or the other of the two pipe end portions; and

a split spring ring received within said annular groove, the spring ring having opposite axial end faces abutting against said flanks of the annular groove; and wherein:

one of the two axial end faces of the spring ring and its associated abutting groove flank define a surface orientation which converges with the surface orientation of the other axial end face and associated abutting groove flank in a shallow, self-locking taper, the angle of taper being smaller than the angle of friction obtaining between said abutting surfaces of the spring ring and of the annular groove, so as to permit the creation of an axial preload between the adjoining pipe end portions, through radial pressure applied to the spring ring, while avoiding any taper-induced radial force reaction on the spring ring, when the pipe connection is subjected to an axial load.

3,863,960
DEVICE FOR TUBE FITTINGS

Rune Sigvard Andersson, Berchshill, Ossjo 43, S-262 00 Angelholm, Sweden

Filed Nov. 26, 1973, Ser. No. 419,118
Claims priority, application Sweden, Dec. 1, 1972, 15664/72; Apr. 30, 1973, 7306053
Int. Cl. F16l *35/00*
U.S. Cl. 285—39 **6 Claims**

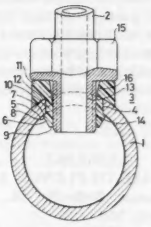
1. The combination of a fitting and sealing element for fitting a branch pipe to an opening in a structure, comprising:

a structure having inner and outer surfaces with an opening passing therethrough;

a generally tubular sealing element of resilient material having axially spaced circumferential shoulder rings;

a generally cylindrical fitting having an externally threaded portion of an outer diameter greater than the internal diameter of said tubular sealing element and an external annular shoulder adjacent one end of said threaded portion;

said sealing element extending through said opening with its circumferential shoulder rings respectively abutting the



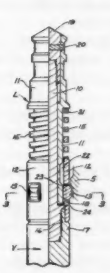
inner and outer surfaces of said structure around said opening, said fitting being threaded through said sealing element with its annular shoulder abutting one of said circumferential shoulder rings; and

that portion of said fitting and sealing elements, radially inwardly of said one shoulder ring, being radially spaced and free of threaded engagement with each other whereby further rotation of said fitting axially compresses said sealing member and urges said shoulder rings axially toward each other into firm sealing engagement with said inner and outer surfaces of said structure.

3,863,961
LATCHING DEVICE

Robert W. Dinning, Houston, Tex., assignor to Macco Oil Tool Company, Inc., Houston, Tex.

Filed Dec. 13, 1973, Ser. No. 424,368
Int. Cl. F16l *55/00*
U.S. Cl. 285—39 **11 Claims**



1. Latching apparatus for selectively locking and releasing a well tool in and from a tubular receiver comprising: a well tool and a tubular receiver, said tubular receiver having an internally projecting shoulder;

stem means connected to said well tool;

body means surrounding said stem means for limited axial movement relative thereto and having an external annular recess thereon;

sleeve means surrounding said body means for limited axial movement relative to said stem means and having radial apertures therethrough;

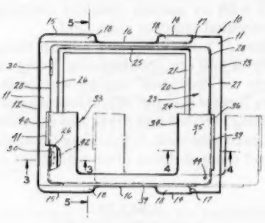
latch means carried in said sleeve means apertures for movement between retracted positions within said apertures and extended positions in which portions of said latch means project out of said aperture means for engagement with said receiver shoulder; and

biasing means engaging and biasing said sleeve means toward a first position in which said latch means is locked in said extended position, said biasing means being capable of being overcome by an axial force applied to said latching apparatus upon movement of said apparatus into said receiver thereby allowing said sleeve means to move to a second position in which said latch means is in registration with said body recess permitting retraction of said latch means and passage of said latch means by said receiver shoulder, said biasing means forcing said sleeve means to return to said first position upon said passage by said receiver shoulder, said body means forcing said latch means into said extended positions locking said well tool in said tubular receiver.

3,863,962
SLIDE-ON BASE-TO-PLENUM ASSEMBLY

DeWayne James Thomas, Belleville, Ill., assignor to Intertherm, Inc., St. Louis, Mo.

Filed Nov. 21, 1973, Ser. No. 417,942
Int. Cl. F16l , *37/26*
U.S. Cl. 285—325 4 Claims



1. For installing counterflow furnaces and like air-delivery appliances connectable through a floor to a sub-floor air duct, a slide-on base-to-plenum assembly comprising

a floor plate having

central window means to make a plenum connection to such sub-floor air duct,

an outer planar plate portion, and

a raised bead portion, outwardly of the window means and having at its outer side a line of juncture with the planar plate portion,

said bead portion having skid parts flanking said window means and extending aft therebeyond to an aft lateral bead part, and

slot means extending forward through said aft lateral bead part at its said line of juncture and located laterally inward of said skid parts, in combination with

an appliance base structure comprising a normally horizontal centrally windowed rectangular frame-like member terminating downwardly in a planar lower edge, whereby to seal against the planar plate portion of the floor plate, said planar lower edge including an aft edge portion, whereby to bear on said bead skid parts during aft movement along said floor plate to an installed position and in said position to seal along said line of juncture,

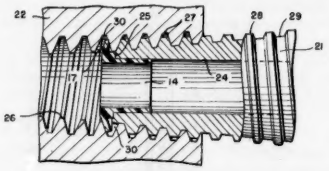
said aft edge portion having forward turned tab means, presented aft of the slot means when the base structure is pushed aft of such installed position, to engage the said slot means on forward movement to such installed position,

whereby, after such engagement, such appliance may be securely attached to such floor by securement at its forward side only.

3,863,963
CHIP-RETAINING BUSHING FOR THREADED ASSEMBLY

Gerald Hershey, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Oct. 23, 1973, Ser. No. 408,492
Int. Cl. F16l *25/00*
U.S. Cl. 285—334 9 Claims

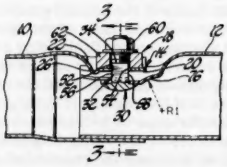


6. In combination, an internally threaded female member, an externally threaded tubular male member threadedly engaged with the female member, the male member having a cylindrical central bore, and a bushing mounted on the male member, the bushing including a cylindrical rear end portion frictionally retained in the bore of the male member, a radially enlarged intermediate portion extending outwardly from the cylindrical end portion to provide an annular stop shoulder engaging the end of the male member, and a frusto-conical flexible and resilient flange portion extending outwardly from the forward end of the bushing and rearwardly toward the cylindrical rear end portion, the diameter of the outer periphery of the flange portion being greater than the minor diameter of at least some of the threads of the female member, the flange engaging the threads of the female member as the male member is threaded into the female member, the forward end of the flange portion being spaced forwardly from the stop shoulder whereby a chip-retaining pocket is formed between the forward end of the male member and the flange portion.

3,863,964
PIPE JOINT WITH IMPROVED FASTENER ASSEMBLY

Thomas R. Cassel, 226 Shirley, Birmingham, Mich. 48009

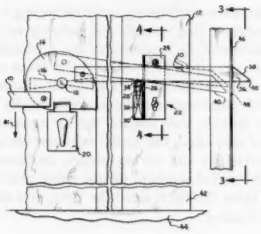
Filed Dec. 16, 1971, Ser. No. 208,591
Int. Cl. F16l *19/00*
U.S. Cl. 285—382 6 Claims



1. In a pipe coupling of the type which comprises an inner pipe and outer pipe each having inward deformations adjacent one end, an opening in each of said deformations, a bolt having a head inside the outer pipe and a shank extending outwardly through the opening in the outer pipe, the opening in the inner pipe being a slot extending to the end of the inner pipe to permit insertion of the inner pipe into the outer pipe when the slot is aligned with the bolt, the end of the inner pipe extending into the end of the outer pipe with the deformations in nested relation, a spacer disposed outside the outer pipe with the shank of the bolt extending through an opening in the spacer and a nut threadedly engaging said shank outwardly of said spacer, whereby, upon tightening of the nut, the end of the outer pipe is stretched around the end of the inner pipe in close fitting engagement therewith, the insertion of the inner

pipe into the outer pipe being facilitated by the improvement comprising: said shank of the bolt and the wall of the outer pipe surrounding the opening therein constituting an interference fit whereby the head of the bolt is retained in spaced relation to the wall of the outer pipe when the force urging the shank through the opening in the outer pipe is less than a predetermined value thereby permitting the inner pipe to be slidably inserted into the outer pipe with the head of the bolt being spaced inwardly of the inner pipe, said interference fit being yieldable when the nut is tightened to urge said shank through said opening in the outer pipe with a force greater than said predetermined value whereby the head of the bolt is drawn into engagement with the inner pipe and said deformations are drawn together to stretch the outer pipe about the inner pipe.

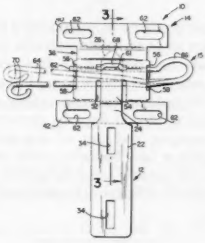
3,863,965
GARAGE DOOR LOCK
William S. Vickers, 1186 Jericho Rd., Abington, Pa. 19001
Filed June 20, 1973, Ser. No. 371,862
Int. Cl. E05c *5/00*
U.S. Cl. 292—66 **3 Claims**



1. A lock for securing a garage door or like closure in a closed position with an edge of the door in flush engagement against a movable sill or like surface, where the lock includes a locking bar having a nose at the free end thereof, means for extending the bar so that the nose moves toward one side of the door, and a fixed keeper located at such side of the door and having a bar-engaging surface facing the sill so that upon closing of the door on the sill, extension of the bar moves the nose toward the keeper to engage the surface and lock the door against movement away from the sill; the improvement comprising a bar guide on the door adjacent the fixed keeper, the guide including a bar guide surface facing the sill and engagable with a side of the bar facing away from the sill and means biasing the bar toward the guide surface to hold such side of the bar normally against the bar guide surface while permitting movement of the bar from such surface toward the sill, whereby, depending upon the position of the sill relative to the fixed keeper, extension of the bar to position the free end in engagement with the bar-engaging surface may move the bar from the bar guide surface against the action of said means.

3,863,966
CATCH ASSEMBLY
Gunnar E. Swanson, Middletown, Conn., assignor to The Nielsen Hardware Corporation, Hartford, Conn.
Filed Apr. 9, 1973, Ser. No. 349,264
Int. Cl. E05c *19/06*
U.S. Cl. 292—87 **31 Claims**

1. A catch assembly for releasably connecting two members separable in generally opposite directions and comprising a strike unit, and a catch unit for releasable connection with said strike unit, said strike unit having a mounting portion for attachment to one of said members and an elongated shank upwardly projecting from said mounting portion, said shank having a leading end portion at the upper end thereof and a latch engaging portion below said leading end portion, said latch engaging portion defining a generally upwardly facing cam surface and a generally downwardly facing abutment surface thereon, said catch unit having a body including a base portion for attachment to the other of said members and one wall projecting forwardly of said base portion, said one wall having a generally upwardly facing bearing surface inclined generally forwardly and upwardly from said base portion and a generally downwardly opening aperture therethrough substantially larger than said leading end portion for receiving said shank therethrough when said strike unit is in connected position with said catch unit, a latch element supported on said body above said one wall for movement relative thereto between latching and releasing positions and including an operating portion for manual manipulation to move said latch element from its latching position to a releasing position, said latch element in its latching position having a part thereof disposed in the path of said cam surface for engagement therewith to move said latch element to a releasing position in response to movement of said shank upwardly into and



through said aperture and toward said connected position, said part extending across said aperture between said abutment surface and said bearing surface when said strike unit is in its connected position and said latch element is in its latching position and being engageable with said abutment surface to positively retain said strike unit in connected relation with said catch unit, means for biasing said latch element toward its latching position, first guide means on said body defining a guide surface at the forward end of said aperture extending downwardly for some distance below said forward end for cooperating with one part of said shank to position said shank and maintain it in a generally predetermined path relative to said body during movement thereof upwardly toward and through said aperture and toward said connected position, and second guide means on said body and spaced upwardly from said one wall and said latch element for cooperating with another part of said shank to maintain said shank in substantially fixed position relative to said body in said connected position and to maintain said shank in said predetermined path during movement thereof away from said connected position and toward disengagement from said catch unit.

3,863,967
DOOR STOP
Vernon J. Carrier, 9166 Cerrites No. 19, Anaheim, Calif. 92804
Filed May 14, 1973, Ser. No. 359,999
Int. Cl. E05c *3/96*
U.S. Cl. 292—198 **10 Claims**

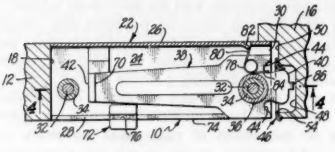
1. The combination of a door pivotally mounted on a door jamb so as to be capable of being moved between a closed position extending across said door jamb and an open position extending away from said door jamb in which the improvement comprises:

an arm pivotally mounted intermediate its ends on said door so as to be capable of being rotated between a first position and a second position relative to said door,

said arm having a jamb engaging end and a wall engaging end,

said wall engaging end extending away from said door when said arm is in said second posititon, said wall engaging end being positioned adjacent to said door when said arm is in said first position,

said jamb engaging end being capable of engaging said jamb when said door is moved from said closed position so as to rotate said arm from said first position to said second position when said door is in said open position and said jamb engaging end being capable of engaging said jamb



when said door is moved from said open position into said closed position so as to rotate said arm from said second position to said first position, so that said arm is in said first position when said door is in said closed position, and latch means for holding said arm against rotation so as to preclude rotation of said door by preventing rotation of said jamb engaging end out of engagement with said jamb, said latch means being movably mounted on said door so as to be capable of being moved to a position in which it physically blocks rotation of said arm from said first position.

3,863,968

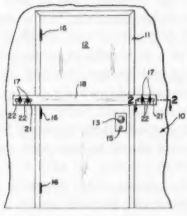
SECURITY DEVICE FOR A DOOR

Myron B. Fraser, 816 E. 21 St., Oakland, Calif. 94606

Filed Oct. 25, 1973, Ser. No. 409,609

Int. Cl. E05c *15/00*

U.S. Cl. 292—260 **6 Claims**



1. In combination with a room wall having inner frame members, a door frame defining an access opening in said wall, and a door for said opening hingedly supported along one edge thereof and equipped with a handle along its opposite edge, the improvement comprising: holding element substantially encircling an inner frame member adjacent the door frame in a manner to shear the inner frame member by movement of said holding element in the direction in which the door swings open; locking means fixed to said holding element and extending through the inside surface of said wall; and security element having high tensile and shear strength, said security element being releasably fastened at one end to said locking means being disposed in bridging relation with the handle-equipped edge of the door, and being secured adjacent its opposite end portion in such bridging relation.

3,863,969

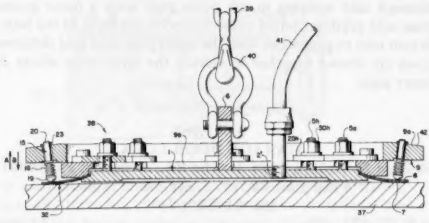
VACUUM LIFTER

Richard B. Weiss, Lower Burrel, Pa., and D. Marshall Fox, South Barwon, Australia, assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 1, 1973, Ser. No. 411,717

Int. Cl. B66c *1/02*

U.S. Cl. 294—64 R **9 Claims**



1. A vacuum lifter comprising a cup including a bottom wall and a lip, a sealing ring, means for holding an edge of the sealing ring hermetically against the lip, a plurality of radial segment means arranged free of restraint from one another, and spring means, independent of said radial segment means, for biasing said radial segment means individually in the direction from the bottom wall toward the lip against the sealing ring outside of said edge, the radial segment means distributing force exerted by the spring means uniformly onto the sealing ring, the radial segment means being able to deflect in the direction from the lip toward the bottom wall against the spring means biasing.

3,863,970

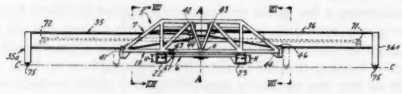
FORK TRUCK SPREADER FOR CARGO CONTAINERS

Carl R. Gottlieb, Mobile, Ala., and Jack E. Fathauer, Roxboro, N.C., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed July 26, 1973, Ser. No. 382,869

Int. Cl. B66f *9/00*

U.S. Cl. 294—67 DA **12 Claims**



1. A cargo container spreader for a carrier having cantilever spreader-supporting means extending horizontally outwardly from the carrier comprising:

a platform frame comprising channel means for receiving said carrier supporting means in guide relation therewith, said platform frame having upward facing bearing means; a skew frame arranged in overlying crosswise relation with the platform frame and having downward facing bearing means received by and resting on said upward facing bearing means, said bearing means being arranged in concentric relation with a normally vertical axis of rotation located centrally of both frames, said frames being connected for relative rotation about said axis;

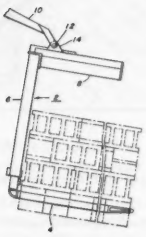
said skew frame being of generally horizontally rectangular configuration and having means at the four corners thereof extending to the level below said platform frame and terminating in latching means for interlocking with a cargo container.

3,863,971

ADJUSTABLE SUPPORT FOR A MATERIAL HANDLING FORK

Charles D. Meads, Hellam, Pa., and Paul R. Hefler, Alger, Ohio, assignors to Dico Company, Inc., York, Pa.

Filed Nov. 12, 1973, Ser. No. 414,675
Int. Cl. B66c 1/22
U.S. Cl. 294—67 AA 5 Claims



1. Apparatus for shifting the point of support of a material handling fork having a substantially horizontal upper frame and substantially horizontal tines suspended from the upper frame, so as to balance the fork from a lift means when handling various loads, which apparatus comprises:

a. substantially horizontal guide means attached to the upper frame;

b. a trolley member adapted to be suspended from the lift means, and to fit and travel on the guide means, so that the trolley member is movable along the length of the guide means, and capable of supporting the guide means at any point along said length; and

c. activating means mounted on the upper frame and operatively connected to the trolley for selectively positioning the trolley at any point along the length of the guide means.

3,863,972

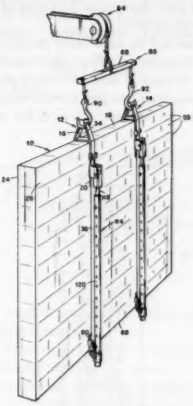
SYSTEM FOR LIFTING AND HANDLING PANELS

Paul M. Thomas, 6306 Mockingbird Ln., Paradise Valley, Ariz. 85253

Division of Ser. No. 254,662, May 18, 1972, Pat. No. 3,765,543. This application May 14, 1973, Ser. No. 360,196
Int. Cl. B66c 1/12
U.S. Cl. 294—74 3 Claims

1. In an apparatus for handling a panel in an upright position the combination comprising

bifurcated yoke means disposed on the top edge of said panel and defining an opening for receipt of lift means, said yoke means including leg portions thereof lying along opposite sides of said panel and a cross member extending between and connecting said leg means to one another and overlying the top edge of said panel, bracket means disposed on the bottom edge of said panel, and band means encircling said panel and engaging said yoke



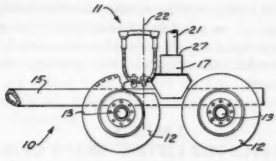
means and said bracket means to releasably secure said yoke and bracket means to said panel.

3,863,973

POLE TRAILER LIFTING ATTACHMENT

Dennis Roger Ross, Box 397, Lumby, British Columbia, Canada

Filed Oct. 19, 1973, Ser. No. 407,945
Int. Cl. B66c 1/20
U.S. Cl. 294—74 3 Claims



1. A lifting attachment for pole trailers having a transverse load bearing bunk including:

a. a length of springy wire rope bent into a U-shape configuration so as to have a bight and straight parallel legs,

b. an elongated rigid bridging piece rigidly connected at its ends to the free ends of the legs, for restraining the length of rope in said U-shaped configuration,

c. means engageable with the rope bight for securing the rope to the trailer near the center of gravity of the latter, and below the bunk, in a normal upright position with the bridging piece uppermost,

d. length of the legs being such that the bridging piece extends above the trailer bunk when the rope is in its normal upright position so as to enable the bridging piece to be engaged by a lifting device.

3,863,974

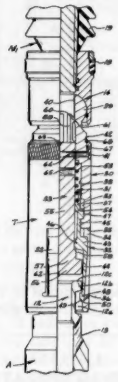
WELL TOOL APPARATUS

Robert W. Dinning, Houston, Tex., assignor to Macco Oil Tool Company, Inc., Houston, Tex.

Filed June 27, 1973, Ser. No. 373,956
Int. Cl. E21b 31/02
U.S. Cl. 294—86.3 15 Claims

1. Well tool apparatus for selective engagement with and disengagement from a well device comprising:

a. tubular body means having radial windows therein;
b. a plurality of latches carried by said body means for radial movement in said windows between retracted positions, engaging said well device, and extended positions, disengaging said well device;
c. cam means carried by said body means and axially movable relative thereto to effect movement of said latches between said retracted and extended positions; and
d. cooperable retainer means comprising retractable and expandable collet means, carried by one of said body



means and said cam means, engageable with corresponding groove means carried by the other, permitting said axial movement of said cam means in response to a predetermined axial force applied thereto, said retainer means also comprising a frangible member connecting said body means and said cam means, said member being frangible in response to an axial force greater than said predetermined axial force to release said cam means for response to said predetermined axial force and operation of said collet means.

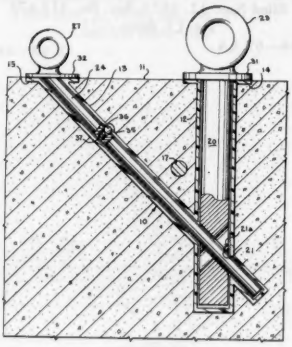
3,863,975

APPARATUS FOR LIFTING HEAVY OBJECTS

Alvin B. Oldenettel, 3500 Red Bluff Rd., Apt. 61, Pasadena, Tex. 77503

Continuation-in-part of Ser. No. 150,008, June 4, 1971, abandoned. This application Jan. 23, 1973, Ser. No. 326,090
Int. Cl. B66c 1/66
U.S. Cl. 294—89 **7 Claims**

1. Apparatus for use in lifting objects of the type which are poured and set, comprising body means having first and second passages and designed for imbedding in an object which is poured and set, said second passage intersecting said first passage intermediate the length of said first passage, lift rod means insertable into said first passage and having a pair of crossed angular bores therethrough, each selectively alignable with said second passage and having connection means at its outer end, lock rod means having connection means at its outer end and being freely insertable into said second passage and into one of said crossed angular bores of said lift rod means to prevent removal of said lift rod means from said first passage, cooperating latch means on said lock rod means and in said second passage for positively retaining said lock rod means in said second passage whereby said lock rod means will not fall out of said second passage even though said object is rotated or inverted and whereby when said body means is imbedded within said object poured and set therearound with the rod-receiving ends of said first and second passages open exterior of the object said cooperating latch means comprising a spring-biased ball detent means disposed in a cavity in said lock rod means and a recess disposed in the wall of said second passage for receiving said ball detent means and said rods are inserted and said lock rod means is latched in place as



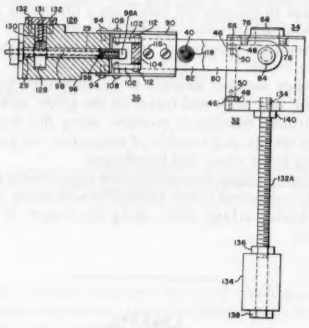
described, said lifting rod may be employed in lifting the object.

3,863,976

REMOTELY OPERABLE EXPLOSIVE PLUG INSERTION TOOL

Emil P. Loch, Tampa, Fla., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 12, 1973, Ser. No. 331,459
Int. Cl. B25b 5/12
U.S. Cl. 294—97 **7 Claims**



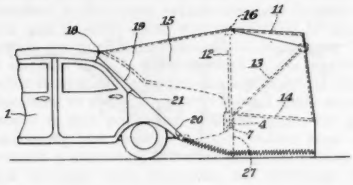
1. An expansion clamp tool for carrying and inserting an explosive plug having an internal opening therein, said expansion clamp tool comprising:
a movable clamp support;
a movable clamp mounted on said clamp support;
means for moving said clamp support from a first open position to a second closed position, said movable clamp support being pivotally attached to said means; and,
means for biasing said clamp support toward the first open position, said clamp being insertable into said opening in said plug when said clamp support is in the second closed position, said clamp support responding to said bias means to return to said first open position to permit said clamp to hold said plug from within said internal opening.

3,863,977

VEHICLE SUPPORTED COLLAPSIBLE SHELTER

Arthur D. Hardinge, Scarborough, Ontario, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 9, 1973, Ser. No. 331,285
Int. Cl. B60p 3/34
U.S. Cl. 296—23 MC 5 Claims



1. A collapsible shelter adapted to be supported by a motor vehicle having a rear bumper and a rear roof edge, said shelter comprising

a plurality of brackets removably affixed to a vehicle, some of the brackets being affixed to the rear bumper and some of the brackets being affixed to the rear roof edge;

a first plurality of support members removably affixed to the brackets and a second plurality of support members affixed to the first plurality of support members and to each other and independent from the ground on which the vehicle rests to form a framework over part of the vehicle and an area of ground behind the vehicle; and

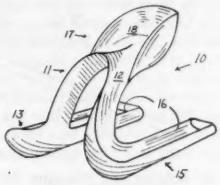
covering material removably affixed to the support members for enclosing the area bordered by the framework and the vehicle, said material extending substantially to the ground in the area of ground.

3,863,978

KNEE-CHAIR

Peter Richard Gillings, Jr., Box 1193, Claremont, N.H. 03743

Filed Apr. 17, 1973, Ser. No. 352,075
Int. Cl. B62j 1/00
U.S. Cl. 296—63 6 Claims



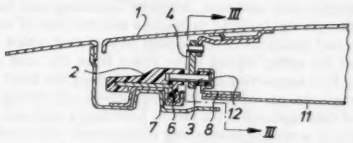
1. A structure for supporting the human body with the trunk and torso generally upright comprising a first section having a saddle-shaped surface upon which the buttocks may rest with the thighs downwardly straddling the saddle-shaped surface and including downwardly and forwardly extending concave surfaces which merge smoothly with a second section, said second section including rearwardly facing upright concave surfaces to restrain the respective knees against forward motion only, and a third section merging smoothly with said second section having means to support the respective legs from below in a substantially horizontal position.

3,863,979

AUTOMOBILE SLIDING ROOF WITH CANOPY FRAME

Horst Bienert, Max-Klingerstr. 15, 8035 Gauting, Germany

Filed Mar. 22, 1973, Ser. No. 343,878
Claims priority, application Austria, Mar. 31, 1972, 82828/72
Int. Cl. B60j 7/04
U.S. Cl. 296—137 E 7 Claims



1. A sliding roof structure for automobiles and the like, comprising in combination:

a fixed roof structure having a substantially rectangular, vertical opening therein;

a generally horizontal, movable sliding roof panel matching the outline of the roof opening to serve as a closure element therefor;

means for operating the sliding roof panel by lowering its rear portion out of the roof opening and then retracting the panel rearwardly under the fixed roof structure, and reversely, by advancing the panel to a position half-way in and half-way below the roof opening and then raising its rear portion into the opening so as to close the roof; means for horizontally guiding the sliding roof panel against the roof structure during its retracting and advancing motions; and

a canopy frame mounted underneath the sliding roof panel, the front portion of the canopy frame being attached to the forward end portion of the panel, the rear portion being vertically movable relative to the panel;

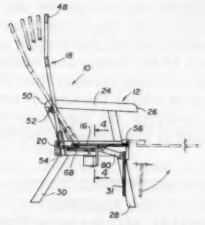
the canopy frame including connecting means between it and the panel guide means for vertically constraining the canopy frame rear portion relative to the panel guide means, while permitting relative horizontal displacement there between.

3,863,980

GERIATRIC CHAIR

Elliot Ciner, 520 E. 21st St., Brooklyn, N.Y. 11226

Filed June 15, 1973, Ser. No. 370,229
Int. Cl. A47c 1/02, 1/06
U.S. Cl. 297—69 4 Claims



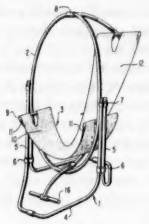
1. A geriatric chair comprising a pair of facing vertically oriented arm rests bounding a seat compartment therebetween, each arm rest having a horizontally oriented support with front and rear end portions extending the depth of said seat compartment so as to be respectively located adjacent the front and rear of said chair, a seat support in said seat compartment, a seat slidably disposed on said seat support having a first operative position of movement located rearwardly in

said seat compartment adapted for sitting service of said chair and having a second operative position of movement located forwardly in said seat compartment adapted for facilitating rising from said seat by shifting the weight of the user to said chair front and between said front end portions of the supports of said arm rests, a seat-holding means for holding said seat in said first and second positions of movement, a backrest pivotally mounted adjacent the rear end portions of the supports of said arm rests and having a lower edge thereon in pushing engagement with said seat, whereby actuating said backrest through a pivotal traverse provides a selected one of said first and second positions of movement of said seat which is best adapted for either sitting in or rising from the seat of said chair, a foot-supporting panel mounted along the front of said seat for pivotal movement independently of said sliding movement of said seat, and drive means including a rack and pinion operatively arranged in meshing engagement with each other with an extent of frictional resistance against movement to normally hold said foot-supporting panel in its pivotal positions of movement supported in depending relation along the undersurface of said seat operatively connected to urge said foot-supporting panel through pivotal traverses relative to said seat.

3,863,981
CHAIR

Edward R. Doyle, 8733 N. 33rd St., Tampa, Fla. 33604

Filed Mar. 12, 1973, Ser. No. 340,457
Int. Cl. A47c *3/00*
U.S. Cl. 297—278 **10 Claims**



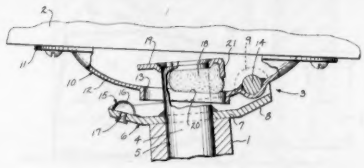
1. A chair comprising a stand forming a base and including upright side portions on opposite sides of the chair, a frame extending transversely of the chair and having opposite sides mounted on the upright side portions of the base for supporting a seat portion thereabove, a support arm extending transversely of the frame between the upright side portions and upwardly behind the seat, means for adjustably connecting the support arm adjacent one end portion thereof with the frame for tilting movement of the support arm relative thereto, means for adjustably locking the support arm in a tilted position with respect to the frame, and means connected to the support arm for receiving pressure from the feet of an occupant of the chair to release the support arm from the locking means and to reengage the support arm with the locking means subsequent to adjustment of the tilting of the support arm.

3,863,982
TILT-SWIVEL MECHANISM FOR A CHAIR

Edwin C. Sandham, Thiensville, Wis., assignor to EST Company Incorporated, Grafton, Wis.

Filed Feb. 5, 1973, Ser. No. 329,525
Int. Cl. A47c *3/00*
U.S. Cl. 297—302 **6 Claims**

1. A tilt-swivel mechanism for a chair to enable the seat of the chair to swivel as well as tilt to the rear, comprising a supporting structure, a vertical shaft journaled for rotation about its axis with respect to said supporting structure, a mounting plate secured to said shaft and spaced below the upper end of the shaft, an upper dish-shaped annular support member located above said mounting plate, a chair seat secured to said upper support member, said upper support member having a peripheral portion secured to said chair seat and having a central body portion extending downwardly from said peripheral portion and terminating in a generally flat bottom surface spaced beneath said chair seat, said bottom surface having a single operative opening to receive said shaft, hinge means for hinging the upper support member to said

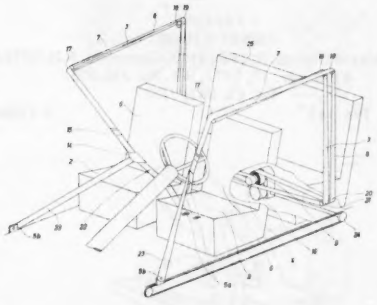


mounting plate to enable the upper support member and said chair seat to tilt to the rear, abutment means secured to the upper end of the shaft and located above the bottom surface of said upper support member, and resilient means disposed and held between said abutment means and the bottom surface of said upper support member whereby said resilient means is concealed by said dish-shaped support member, rearward tilting of said chair seat acting to pivot said bottom surface upwardly and compress said resilient means against said abutment means to cushion the tilting action.

3,863,983
SEAT BELT SYSTEM

Alfred Wriedt, Friedrichshulderweg 186, 2083 Halstenbek, Germany

Filed Apr. 18, 1973, Ser. No. 352,354
Int. Cl. A47c *31/00*; **A47d** *15/00*
U.S. Cl. 297—388 **5 Claims**



1. Apparatus for holding and releasing the occupant of a passenger vehicle in and from a seat therein independently of manual assistance from the occupant, said apparatus comprising,

a pelvic strap connected to and extending between an inner point of attachment to the lower structure of the vehicle near its longitudinal centerline and on one side of the occupant's place and outer point of attachment to the lower structure of the vehicle on the other side of the occupant's place to provide a bight in said strap for passing over the pelvic region of a seat occupant and for holding the pelvic region of the occupant on the base and against the back rest of the seat,

said outer point of attachment to which said pelvic strap is connected being movable fore and aft of the vehicle from

an aft position for holding the bight of said pelvic strap in a restraining relationship with a chair seat occupant to a forward position permitting unobstructed access to and from the chair seat on the side of said movable point of attachment,

a shoulder strap and associated winching means attached to the structure of the vehicle,

a releasing strap and associated winching means attached to the structure of the vehicle,

guide means for guiding and positioning said shoulder strap and said releasing strap during operation of the apparatus, said guide means comprising a forward guide device attached to the upper vehicle structure forward of the seat and an after guide device attached to the upper vehicle structure behind the seat,

said shoulder strap being connected to the bight of said pelvic strap at a point intermediate its ends and extending therefrom to and being guided by said guide means and thence to said associated winching means for guiding, positioning and tensioning said shoulder strap to and between a restraining and a releasing relationship with a seat occupant upon retraction and extension, respectively, of said associated winching means,

said releasing strap being connected to said shoulder strap at a point intermediate its ends and extending therefrom to and being guided by said guide means and thence to said associated winching means for guiding, positioning and tensioning said releasing strap to and between positions for lowering said shoulder strap into its restraining relationship with a seat occupant upon extension of said releasing strap winch and for lifting said shoulder strap into its releasing relationship with a seat occupant upon retraction of said releasing strap winch,

said shoulder and said releasing strap being operatively related to said guide means whereby said shoulder strap in its restraining relationship with a seat occupant extends from said pelvic strap across the upper torso of the seat occupant to its said after guide device and to its associated winching means and said releasing strap extends from said shoulder strap over said after guide device forward to said forward guide device and thence rearward to said after guide device and to its associated winching means, and whereby said shoulder strap in its releasing relationship with a seat occupant is lifted from the upper torso of the seat occupant and its point of attachment with said releasing strap is carried up to and over said forward guide device by retraction of said releasing strap, means to move said movable point of attachment to which said pelvic strap is connected, the operation of said means and said winching means associated with said shoulder strap and with said releasing strap being coordinated so that said movable point of attachment of said pelvic strap moves forward and said shoulder strap loosens and said releasing strap lifts said shoulder strap forward and away from a chair seat occupant to provide unobstructed access to and from said chair seat, and so that said movable point of attachment of said pelvic strap moves aft and said shoulder strap tightens and said releasing strap allows said shoulder strap to tighten into a restraining relationship with said chair seat occupant.

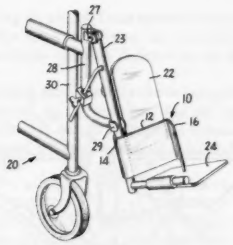
3,863,984

LEG-SUPPORTING AND-RETAINING DEVICE ATTACHABLE TO AN ELEVATABLE LEGREST OF A WHEEL CHAIR

Nancy E. Sickels, 408 N. Midland Ave., Nyack, N.Y. 10960

Filed Dec. 1, 1972, Ser. No. 311,360
Int. Cl. A47c *7/50*
U.S. Cl. 297—427 **11 Claims**

1. A device attachable to an elevatable legrest of a wheel chair for retaining the leg of a person sitting in the wheel chair upon the legrest comprising: a body portion; clamping means connected to said body portion for releasably clamping same to an elevatable legrest of a wheel chair during use of the device; and retaining means connected to said body portion for retaining the leg of a person sitting in the wheel chair upon the elevatable legrest by preventing lateral inward movement of the leg; the device being composed of a single sheet of resilient material configured at one end into said clamping



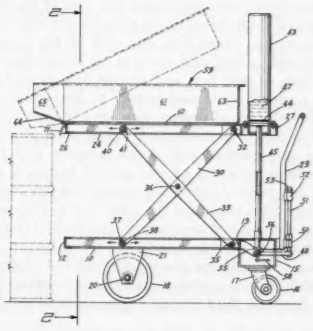
means and configured at the other end into said retaining means; and wherein said clamping means comprises an arcuate end portion of said sheet and said retaining means comprises another arcuate end portion of said sheet and wherein said body portion is interposed between and interconnects said arcuate end portions; whereby the device prevents the person's leg from falling off the elevatable legrest.

3,863,985

OFFAL CART

Chauncey E. Zuber, c/o E. F. Zuber Engineering & Sales Co., 800 W. 79th St., Bloomington, Minn. 55420

Filed July 9, 1973, Ser. No. 377,637
Int. Cl. B62b *1/00*
U.S. Cl. 298—2 **11 Claims**



1. A cart for reception of offal from slaughtered livestock animals, which cart comprises:

A. a lower frame comprising at least a pair of parallel spaced apart longitudinal members interconnected by at least a pair of forward and rearward parallel spaced apart transverse members,

B. wheel means supporting said lower frame for movement,

C. an upper frame of construction corresponding to said lower frame and overlying said lower frame,

D. means for vertically raising and lowering said upper frame relative to said lower frame, and

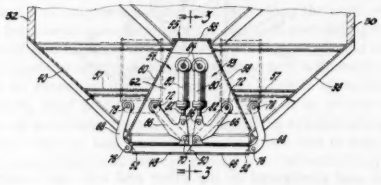
F. an offal receiving tray supported on said upper frame, said offal receiving tray being open at one end and pivotally attached to said upper frame adjacent to that end.

3,863,986

OPERATING LINKAGE FOR BOTTOM DUMP DOORS

Roland A. Mentessi, Parma, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 4, 1973, Ser. No. 394,139
Int. Cl. B60p 1/56
U.S. Cl. 298—35 M 2 Claims



1. In a bottom dump vehicle having a trailing hopper provided with an elongated opening adapted to be opened and closed by a pair of longitudinal doors, a linkage for controlling movement of said doors between a first position wherein said doors are horizontally aligned to close said opening and a second position wherein said doors are shifted laterally outwardly to expose the opening and permit the contents within the hopper to be dropped by gravity, said linkage including a pair of hydraulic cylinders, each of said doors having an inner edge and an outer edge, said linkage for each of said doors comprising a first link member and a second link member, a first pivotal connection supporting one end of the first link member on said each of said doors at said inner edge, a second pivotal connection supporting one end of the second link member on said each of said doors at the outer edge thereof, the other ends of said first and second link members being connected respectively to said hopper by horizontally spaced third and fourth pivotal connections, one of said pair of hydraulic cylinders being connected to said each of said doors for moving said each of said doors between said first and second positions, said one of said pair of hydraulic cylinder having one end thereof connected to said first link member by a fifth pivotal connection and the other end connected to the hopper by a sixth pivotal connection, said pivotal connections being so arranged that when said each of said doors is in the first position a straight line passing through the centers of the fifth and sixth pivotal connections extends between the centers of the first and third pivotal connections of the first link member.

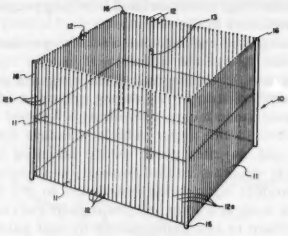
3,863,987

CONTROLLED IN SITU LEACHING OF ORE DEPOSITS UTILIZING PRE-SPLIT BLASTING

William J. Lampard, Salt Lake City, Utah, assignor to Kennecott Copper Corporation, New York, N.Y.

Filed Feb. 12, 1973, Ser. No. 332,015
Int. Cl. E21b 43/28
U.S. Cl. 299—4 10 Claims

1. A method of in-situ leaching of mineral deposits, comprising driving a series of pre-split blasting bore holes into or near an underground area to be leached for the recovery of mineral values therefrom; blasting a pre-split fracture along said series of bore holes to provide a barrier to fluid flow; injecting a leach solution into or near said area for diffusion through said area, said barrier limiting flow of said fluid; and



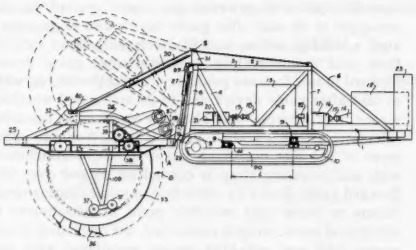
recovering pregnant leach solution from parts of said area into which said pre-split fracture has directed the flow of solution.

3,863,988

DITCHER FOR PERMAFROST

Fred Willie Bartels, Edmonton, Alberta, Canada, assignor to Banister Continental Ltd., Edmonton, Province of Alberta, Canada

Filed Mar. 20, 1973, Ser. No. 343,107
Int. Cl. E02f 5/08
U.S. Cl. 299—25 10 Claims

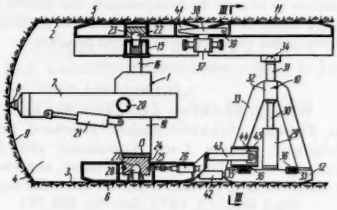


1. In a ditcher comprising
a carrier having a main frame, extending substantially parallel to the ground surface, and an upstanding suspension frame rigidly secured to said main frame, and
a rigid wheel frame, supporting a rotatable ditching wheel, pivotally connected at its front end to the suspension frame and movable thereon between a lowered position and an elevated position, and
means for raising and lowering the wheel frame between said positions,
the improvement which comprises
a hold down hydraulic cylinder pivotally connected at its front end to the suspension frame for rotation about an axis substantially parallel to the plane of the main frame; means slidably connecting the rear end portion of the hold down cylinder with a portion of the wheel frame, said means comprising slide means, formed in one of the portions, having stop faces at each end of the slide means, and a connecting member joining the portions together, whereby the connecting member may move along the slide means between the limiting stop faces; and
means for controllably actuating the hold down hydraulic cylinder to expand or contract it.

3,863,989
HARD-ROCK MINING MACHINE

Bogdan Vyacheslavovich Voitsekhovsky, ulitsa Ilicha 17, kv. 16; Valentin Pavlovich Nikolaev, ulitsa Pravdy 5a, kv. 21; Grigory Yankelevich Sholkhet, ulitsa Gerovetruda, 21, kv. 49; Leonid Alexeevich Mitin, ulitsa Akedemicheskaya, 2; Lidia Petrovna Dimova, ulitsa Maltseva, 1, kv. 8, and Vladimir Alexeevich Samusenko, ulitsa Pravdy, 1 kv. 34, all of Novosibirsk, U.S.S.R.

Filed Nov. 10, 1972, Ser. No. 305,509
Int. Cl. E21c *37/24*
U.S. Cl. 299—31 **4 Claims**

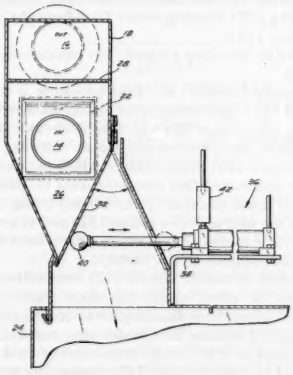


1. A hard-rock mining machine movable stepwise in a heading having a roof, a floor and a face to be worked, comprising a manipulator frame, said frame being provided with upper and lower support means thrustable against the roof and floor respectively, a horizontal shaft mounted in a middle section of the frame, a percussive means having an impact energy exceeding 10,000 kgm mounted on the horizontal shaft for working on the face of the heading, two vertical shafts positioned in the upper and lower portions of the frame, and complemental means on the upper and lower support means and the vertical shafts providing universal connections whereby the frame can rotate relative to the upper and lower support means around its vertical axis.

3,863,990
PNEUMATIC FEED SYSTEM HAVING A CALL-DUMP-FILL CYCLE

Francis J. Ballard, Jr., Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Oct. 17, 1972, Ser. No. 298,291
Int. Cl. B60t *8/00*
U.S. Cl. 302—28 **6 Claims**



1. A tobacco discharger for association with a cigarette making machine and an automatic tobacco conveying system which pneumatically conveys tobacco from a storage area to the discharger and ultimately to the associated cigarette making machine with the system including a main feed pipe for coupling with the source of the stored tobacco and the tobacco discharger, air differential pressure means for forcing air through the pipe at a predetermined conveying velocity, a tobacco feeder at the source of stored tobacco for feeding the tobacco into the main feed pipe, the tobacco discharger comprising:

a housing having an air inlet and means for coupling the air inlet with the main feed pipe, an air discharger and a tobacco discharge opening defined by an abutment closure surface,

tobacco separating means within the housing for separating tobacco carried by air entering the air inlet end, the tobacco separating means including a tobacco separating screen arranged within the housing intermediate the inlet and discharge,

valve means for stopping the flow of the air through the discharger,

door means forming part of the discharger housing and adapted to be shifted from a closed position during filling of the housing with tobacco and until such time as the separated tobacco is to be discharged into the associated cigarette making machine to an open position where the tobacco within the housing is discharged under the influence of gravity into the associated cigarette making machine, said door means being hingedly connected to said housing at said tobacco discharge opening and swingable through an arc downwardly to discharge the tobacco and upwardly into sealing engagement with said abutment closure surface on the housing, said abutment closure surface being in the path of said arc so that the door will seal the discharge opening, and

discharger door actuating means engaging said door means for moving the door means to a position slightly spaced from the abutment closure surface and holding said door means in said position after filling of the housing with tobacco and until such time as the cigarette machine signals a demand for tobacco, said actuating means then permitting the door means to open whereby the tobacco is discharged into the associated cigarette making machine, the actuating means being comprised of a cylinder assembly having a piston rod with a free end, means at the free end for sliding engagement with the surface of the door means for shifting the door means from an open position through a portion of said arc towards a closed position, the stroke of the piston rod being such that the door means is moved through only a portion of its arc to a position in spaced relation to said abutment closure surface whereby, upon application of pneumatic pressure in the system, said pressure causes the door means to swing through the remainder of said arc and upon deactivation of the pressure, the door means drops to the slightly spaced position and is retained at that position by the piston rod until tobacco is required by the cigarette making machine and then the piston rod is retracted to allow the door to open, said movement to a spaced position avoids damage to the door by the piston rod in that the rod does not drive the door into sealing relation and further avoids the necessity for critical adjustment of the operating stroke of the piston rod.

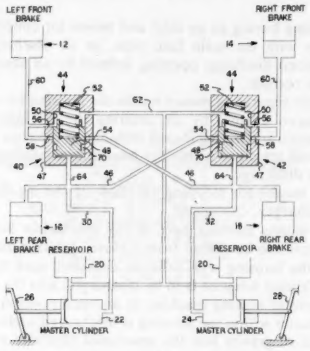
3,863,991
VEHICLE BRAKE SYSTEM

John F. Wilson, Racine, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Sept. 17, 1973, Ser. No. 398,202
Int. Cl. B60t *11/18*
U.S. Cl. 303—6 A **6 Claims**

1. In a braking system for a vehicle having left and right front brakes and left and right rear brakes, an actuating system for said brakes including a source of fluid, left and right individual actuating means cooperating with said source for re-

spectively supplying fluid under pressure to said left and right rear brakes, first and second actuators respectively cooperating with left and right actuating means for moving said actuating means between inoperative and operative positions, and means between said left and right actuating means and said front brakes, said last means including valve means between



said left and right actuating means and said left and right front brakes for (1) supplying fluid under pressure to said front brakes from said actuating means when both actuating means are in operative positions and (2) preventing actuation of said front brakes when either actuated means is in an inoperative position.

3,863,992

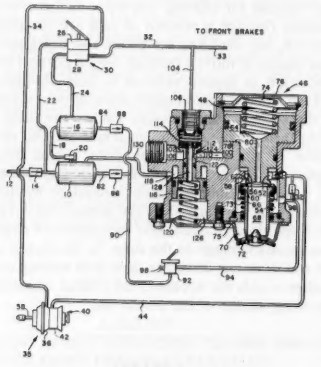
INVERTING LIMITING RELAY VALVE WITH INTERLOCK

Edward J. Kurke, and Roy E. Bartholomew, both of Elyria, Ohio, assignors to The Bendix Corporation, South Bend, Ind.

Filed May 10, 1974, Ser. No. 468,835

Int. Cl. B60t *13/14, 15/12*

U.S. Cl. 303—9 **3 Claims**



1. For use in a fluid pressure braking system of the dual circuit type in which one circuit includes a spring applied fluid pressure released actuator, and a manually operable valve for controlling the application of fluid pressure to said circuits, the invention which comprises a first valve means movable to a first position to supply fluid pressure from a source to said actuator to move the latter to a brake released position and movable to a second position to release fluid pressure from said actuator, to graduate spring brake application thereof in accordance with fluid pressure supplied to said other circuit, and means controlled by fluid pressure from the source for positively preventing fluid pressure release operation of said valve means so long as the fluid pressure from the source is above a predetermined value, said means including a first pressure responsive member for moving said valve means, resilient means for actuating said member to move the valve means to said first position, said member having a motive area, a second valve means movable to a first position for normally connecting said motive area with the atmosphere, and movable to a second position to connect said motive area with the other circuit, and a second pressure responsive member axially aligned with said second valve means and movable in response to fluid pressure from said source to allow the second valve means to occupy its first position, the second pressure responsive member being spring-actuated to positively move the second valve member to its second position.

3,863,993

WHEEL BRAKING CONTROL SYSTEM

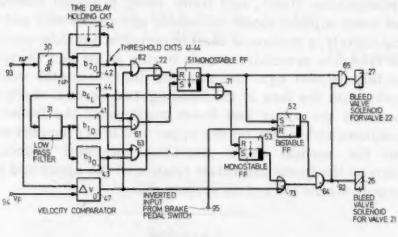
Helmut Fleischer, Schwieberdingen; Eberhard Schnaibel, Hemmingen; Werner Gotz, Friolzheim, and Wolfgang Maisch, Schwieberdingen, all of Germany, assignors to Robert Bosch GmbH, Gerlingen-Schillerhohe, Germany

Filed Sept. 13, 1972, Ser. No. 288,791

Claims priority, application Germany, Sept. 18, 1971, 2146825

Int. Cl. B60T *8/12*

U.S. Cl. 303—21 BE **61 Claims**



1. Vehicle wheel braking control system comprising

means (**20, 25***b*, **25***a*, **20***a*) supplying a brake fluid medium under pressure;

controllable brake pressure valve means (**21**) having a control winding (**26**) and applying pressurized brake fluid to a wheel brake cylinder (**23**);

controllable bleeder valve means (**22**) having a control winding (**27**) bleeding brake fluid from the wheel brake cylinder (**23**);

means (**93**) providing a signal ($r\omega$) representative of wheel speed;

differentiator means (**30, 230**) providing a differentiated signal ($r\omega$) representative of change of wheel speed;

a group of at least three threshold circuits (**41-44**) connected to the differentiator means (**30**), the first threshold circuit (**41**) responding to wheel deceleration above a predetermined first threshold level (b_1) corresponding to maximum wheel deceleration and being connected to open the bleeder valve means (**22**) and to close the pressure valve means (**21**) to effect a steep drop in brake fluid pressure applied to the wheel;

the second threshold circuit (**42**) responding to about 0 change in wheel speed (b_2) upon transition of wheel speed change from deceleration to acceleration and being connected to close the bleeder valve means (**22**) to effect termination of the steep drop in brake fluid pressure;

the third threshold circuit (**43**) responding to a first value of wheel acceleration (b_3) corresponding to wheel reacceleration and being connected to open the pressure valve means (**21**) to effect increase in brake fluid pressure applied to the wheel;

controlled connecting means (65) interlocked with a control connection (92) and interlocking the pressure brake valve winding (26) and the bleeder valve winding (27) to permit bleeding of brake fluid only if the brake pressure valve means (21) interrupts supply of pressurized brake fluid to the wheel brake cylinder (23);

and a low-pass filter (31; 233, 234) connected between the output of the differentiator means (30, 230) and the input of the first (41, 241) and the third (43, 243) threshold circuit, and filtering stray and noise signals from being applied to said first and third threshold circuits effecting steep drop in brake fluid pressure, or increase in brake fluid pressure, respectively.

3,863,994

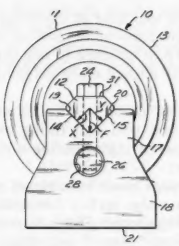
BIDIRECTIONAL ROLLER CUTTER

Trevor Fink, University Heights, Ohio, assignor to Jarva Corporation, Solon, Ohio

Filed Sept. 24, 1973, Ser. No. 400,004

Int. Cl. E21c *13/12*

U.S. Cl. 308—8.2 **13 Claims**



1. A roller cutter assembly comprising a cutter rotatably mounted on a shaft so that end portions of said shaft project from said cutter, each end portion having first and second flat angularly related faces, a generally U-shaped saddle having projecting arm portions mounting said shaft and having a mounting face adapted to be secured to a cutter head, at least one of said projecting arm portions having first and second flat faces which are non-parallel with respect to each other and with respect to said mounting face and which respectively engage the first and second angularly related faces of an end portion, means for clamping said angularly related faces to said flat faces with a clamping force have resultants normal to the engaged faces and on both sides of a plane perpendicular to said mounting face.

3,863,995

FLUID BEARING ASSEMBLY

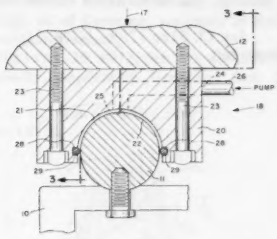
Cecil R. Jones, Orange, Conn., assignor to Transfer Systems Incorporated, North Haven, Conn.

Filed Oct. 23, 1973, Ser. No. 408,995

Int. Cl. F16c *29/02, 33/72*

U.S. Cl. 308—9 **7 Claims**

1. In combination with a machine having first and second parts movable relative to one another along confronting first and second bearing surfaces with the first of the movable parts exerting a load in a given direction including a component generally orthogonal to the confronting bearing surfaces and tending to increase the frictional forces resisting the movement at the first and second bearing surfaces, a fluid bearing comprising means on one of the parts providing a third bearing surface extending generally orthogonal to the load direction component and confronting the second bearing surface on the other of the parts, at least one opening in one of the second and third bearing surfaces, an annular sealmember mounted in one of the second and third bearing surfaces so as to protrude therefrom and surround said opening, means for furnishing pressurized fluid to the said opening, the location of the opening and the fluid pressure being such that the fluid exits from said opening and impinges on the confronting bearing surface in a direction so as to provide a fluid force substantially opposite to the load and tending to lift the load of the first part and thereby reduce the frictional forces at the first and second bearing surfaces, the seal member being located in a position to impede the flow of fluid between the second and third bearing surfaces.



3,863,996

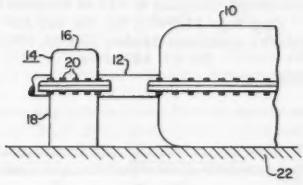
VIBRATION DAMPER BEARING

Albert A. Raimondi, Monroevile, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 27, 1973, Ser. No. 374,179

Int. Cl. F16c *1/24;* **F16c** *7/04;* **F16c** *39/04*

U.S. Cl. 308—122 **5 Claims**



1. A damper bearing for a vibrating rotatable shaft having a journal portion thereon, said damper bearing comprising:

a bearing structure for rotatable supporting said journal portion of said shaft,

a support member surrounding said bearing structure,

means for introducing a lubricating fluid into said bearing structure, said lubricating fluid forming a hydrodynamic film about said journal to support said shaft when said shaft is rotating, said hydrodynamic film having a predetermined pressure existing therein when said shaft is rotating, and,

damping means disposed between said bearing structure and said support member, said damping means comprising

a predetermined plurality of cavities disposed equiangularly about the surface of said bearing structure, said cavities being adjacent to said support member,

means for conducting said fluid from said film to said cavities, and,

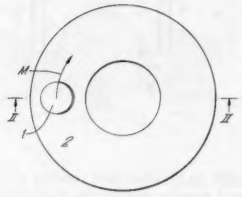
flow restrictor means disposed within said conducting means, said flow restrictor means lowering the pressure of the lubricating fluid conducted to said cavities,

said fluid conducted into said cavities being disposed in a layer between said bearing structure and said support structure to absorb and to dampen vibrations transmitted to said bearing structure by said shaft when said shaft is rotating.

3,863,997
CONICAL BEARINGS

Anthony Roger Davis, Cirencester, England, assignor to Vickers Limited, London, England

Filed Aug. 21, 1973, Ser. No. 389,630
Claims priority, application Great Britain, Aug. 26, 1972, 39868/72
Int. Cl. F16c *17/06, 17/08, 23/04*
U.S. Cl. 308—160 1 Claim



1. A bearing that includes an axial piston swash plate having pivoted slipper pads, and a swash plate having a thrust face on the pads run in operation, the surface of each pad that runs on the thrust face being substantially flat and the thrust face being of conical form generated from a centre about which the motion of each pad is substantially circular and so as to be convex with respect to the substantially flat running surfaces of the pads.

3,863,998
DOCUMENT FILES, FOLDER, REGISTERS AND THE LIKE

Carl-Erik Grundell, Osogatan 8, 122 48 Enskede, Sweden

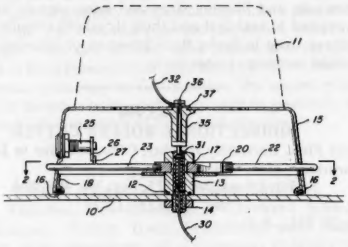
Filed Sept. 25, 1973, Ser. No. 400,509
Claims priority, application Sweden, Sept. 25, 1972, 12369/72
Int. Cl. A47f *3/14*
U.S. Cl. 312—184 6 Claims

1. A register comprising in combination a substantially flat preferably rectangular base member, movable members such as strips, slideably arranged relative thereto, said base member comprising a sheet member, made from relatively thin but stiff as cardboard, said sheet member having two opposite ends thereof folded to generate anchoring means, a profile having a substantially planar web portion, first and second abutment portions extending substantially perpendicular to said web portion and first and second guiding portions extending from said abutment portions and directed towards each other and substantially parallel to said web portion such that a longitudinal channel is formed in the profile with said channel having an extension parallel to the plane of said web portion which considerably exceeds the extension in a direction perpendicular to said web portion, the extension of said guiding portions being such that a longitudinal groove communicating with said channel is generated, the folded anchoring portions of said base member having an extension which substantially corresponds to the corresponding portions of said channel, said anchoring portions being sideways introduced in said channel with said folded portions located in said channel such that the main portion of said base member will first substantially follow one of said guiding portions, then pass through said slot and finally extend substantially parallel to said web portion of said profile thereby generating a support for said movable members as well as together with said other guiding portions of said profile resilient guides for the ends of said movable members.

3,863,999
DETACHABLE WARNING LIGHT

Philip O. Muller, 13005 James Ave., South, Burnsville, Minn. 55337

Filed Dec. 26, 1973, Ser. No. 427,820
Int. Cl. H01r *13/54*
U.S. Cl. 339—10 10 Claims



1. Apparatus for attaching an electrical appliance to a surface for subsequent convenient removal, comprising:

A. an insulated post attached to said surface and having an internal axially aligned electrical conductor and a shoulder;

B. an appliance mounting base having a mounting hole sized larger than said post and fitting over said post, said mounting base having a bearing surface extending near said shoulder;

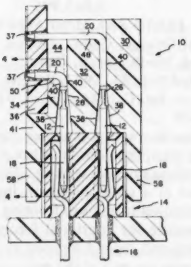
C. a slidable wedge block movable on said bearing surface and having a wedge incline for contacting said shoulder for transmitting a locking force from said shoulder to said bearing surface;

D. a quick-disconnect electrical coupling attached to said mounting base at a position to contact said post internal electrical conductor when said mounting base is positioned over said insulated post.

3,864,000
MATING CONTACT CONNECTOR HOUSING ASSEMBLY

James Ray Coller, Mechanicsburg, and Robert Franklin Cobaugh, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed June 7, 1973, Ser. No. 367,926
Int. Cl. H01r *21/28*
U.S. Cl. 339—64 M 3 Claims



1. An electrical connnector having a plurality of electrical terminals mounted in rows within a housing of dielectric material, comprising:

first and second rows of apertures in said housing receiving said terminals,

said housing having a first end portion and a second end portion,

each aperture having a relatively large first portion extending through said first end portion of said housing and an adjacent relatively narrow second portion extending through said second end portion of said housing,

each terminal having a relatively enlarged wide portion received in a corresponding first portion of a corresponding aperture and protruding from said first end portion of said housing,

each terminal having a relatively narrow portion received in a corresponding second portion of a corresponding aperture,

said housing defining a seating portion between the first and second portions of each aperture,

each terminal engaging and seating against a corresponding seating portion,

said housing second end portion defining first and second anvil surfaces,

said first row of terminals having the second portions thereof extended outwardly of said first row of apertures and bent to overlie against said first anvil surface and to project outwardly of said housing, and

said second row of terminals having said second portions thereof extended outwardly of said second row of apertures and bent to overlie against said second anvil surface and to project outwardly of said housing.

3,864,001

LAMP SOCKET

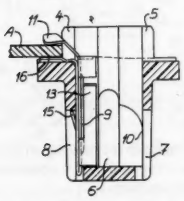
Jean Joseph Millet, Besancon, France, assignor to S.O.C.O.P. S.A., Besancon, France

Filed Oct. 18, 1973, Ser. No. 407,673

Claims priority, application France, Nov. 3, 1972, 72.39059

Int. Cl. H01r *13/46*

U.S. Cl. 339—127 **4 Claims**



1. Miniature lampholder, comprising a socket for mounting a miniature lamp having a stem, means on the socket for mounting it in an aperture of a plate, and at least two contact means for detachably mounting the lamp in the aperture and electrically connecting conductors on the lamp stem to plate conductors, each contact means comprising a spring strip folded into the general configuration of a flattened V having inner and outer sides and free end parts thereof, the sides of each V being located in a peripheral recess in the socket and the free end parts being bent externally of the recess to form a bayonet for gripping the plate and making electrical connection with a plate conductor.

3,864,002

CONNECTION DEVICE FOR AN ELECTRICAL APPARATUS

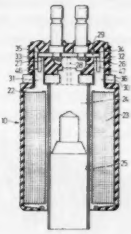
Joachim Naser, Nurnberg; Fritz Horn, Lichtenau; Ludwig Specknew, Nurnberg; Theo Sturm, Neukirchen; Olaf Schmid, Schwabach; Erich Ebenhoh, Ansbach, and Karl Berthel, Roth, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 25, 1973, Ser. No. 409,501

Claims priority, application Germany, Oct. 25, 1972, 2252167

Int. Cl. H01r *3/00*

U.S. Cl. 339—147 R **4 Claims**



1. A connection device for at least one operating winding of an electrical apparatus such as an electromagnet, said connection device having at least two terminal connections connected to said winding, carrying at least two contact pins, and having the improvement that:

said device includes a copper-clad conducting pattern plate (**29**) to which said contact pins (**16, 17**) are fastened;

said terminal connections of said winding (**23**), said contact pins (**16, 17**) and said electric circuit components (42,43) are connected with said conducting pattern plate (**29**);

said conducting pattern plate (**29**) rests against at least two supports (**26,27,28**) connected to a carrier body (**22**) for said operating winding (**23**) and is held in place by at least two resilient catches extending from said carrier body (22);

said conducting pattern plate is oriented perpendicular to the axis of said winding (**23**) near one end thereof and is at least approximately centered on said axis;

said supports and said resilient catches are separately constituted to the extent necessary to assure that displacement of said catches produced by seating said pattern plate does not produce any substantial displacement of said respective catches, and

said resilient catches are collectively surrounded by a protective collar of insulating material coaxial with said winding.

3,864,003

LOCK NUT COOPERABLE WITH ELECTRICAL TERMINAL BLOCK

Artur Oloy Boke, Linkoping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed June 18, 1973, Ser. No. 370,684

Claims priority, application Sweden, June 26, 1972, 8375/72

Int. Cl. H01r *9/00*

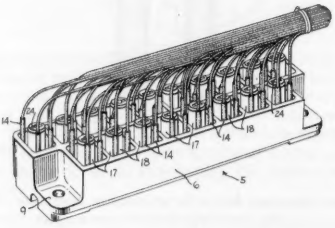
U.S. Cl. 339—198 R **4 Claims**

1. Terminal means for electrical conductors having eyelet connectors on their end portions and by which the eyelet connectors can be fixed in good electrical and mechanical connection with one another, said terminal means comprising: A. a terminal body member of insulating material having a base wall;

B. a screw member fixed to said base wall and having a threaded shaft projecting upwardly therefrom;

C. said terminal body member having other wall portions projecting upwardly from said base wall to near the top of said shaft, said other wall portions surrounding the shaft all around the same and in close proximity thereto and joining one another at corners in which can be received portions of conductor wires that have their eyelet connectors around the shaft and adjacent to the base wall; and

D. means for maintaining good electrical connection between the screw shaft and eyelet connectors around it while securely but removably holding the eyelet connectors in place adjacent to the base wall, for confining in said corners the conductor wires that are connected to said eyelet connectors, and for electrically insulating the screw shaft and the eyelet connectors while leaving said shaft accessible to a test prod, said means comprising



1. a substantially tubular member of rigid but deformable insulating material, substantially longer than the screw shaft, said tubular member having a substantially cylindrical external surface of a diameter to be closely receivable between said other wall portions and having a bore extending through the entire length thereof, said bore

   1. being of noncircular cross section in an upper end portion thereof to receive a correspondingly noncircular driving tool by which the tubular member can be rotated, and

   2. having, intermediate its ends, a transverse dimension somewhat smaller than that of the screw shaft to provide inner surface portions on the tubular member that are deformably engageable with the crests of the threads on the screw shaft to inhibit rotation of the tubular member relative thereto; and

2. a coaxial substantially tubular metal insert anchored in the lower end portion of said bore and having an internal thread cooperable with the thread on the screw shaft.

3,864,004

CIRCUIT BOARD SOCKET

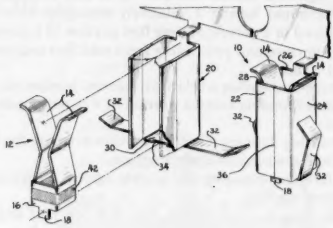
Lindsay C. Friend, Camp Hill, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 30, 1972, Ser. No. 310,871

Int. Cl. H01r *13/12, 9/06*

U.S. Cl. 339—258 R **6 Claims**

5. A two part circuit board socket including an elongate hollow socket body with an open end and a closed end, a pair of exterior spring arms joining the body at said closed end and extending therefrom along opposite sides of the body, said arms being bowed outwardly of the body for securing the body in a circuit board hole prior to soldering, a longitudinal body seam extending the length of the body from the open end to the closed end, a body seam extending across each exterior spring arm at the junction with the body at the closed end; and a spring metal contact member located within the body for engaging a lead inserted into the body through the open end, said member including a solder contact on the outside of the body and a portion extending through an opening in the body connecting said solder contact and said member; and a solder



resistant surface on the interior of said body adjacent said seams to prevent molten solder from flowing through the seams and into the interior of the body.

3,864,005

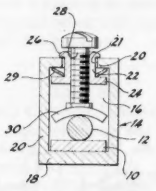
RESILIENT ELECTRICAL TERMINAL CONNECTOR

Keith William Klein, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Oct. 11, 1973, Ser. No. 405,686

Int. Cl. H01r *7/12*

U.S. Cl. 339—272 R **1 Claim**



1. A terminal connector for making an electrical connection between a terminal strap and a wire conductor, said connector comprising, in combination:

A. a rigid frame having a central opening and means forming an aperture through a wall of said frame into said central opening;

B. a sleeve accommodated in said wall aperture, said sleeve having a threaded axial bore and terminating in inner and outer axially spaced, radially extending flanges, said flanges engaging said wall about said aperture to capture said sleeve in said wall aperture and to limit the degree of reciprocal motion of said sleeve through said wall aperture;

C. a clamping bolt threadedly engaged in said axial bore to advance a free end thereof into said central opening;

D. a clamping plate mounted by said free end of said bolt for clamping a wire conductor introduced into said central opening in electrical connection with a terminal strap therein; and

E. a spring positioned within said central opening and acting between said inner flange of said sleeve and said frame to exert a resilient clamping force on the wire conductor.

3,864,006

LUMINAIRE HAVING A HOLDER FOR A CAPLESS MINIATURE INCANDESCENT LAMP

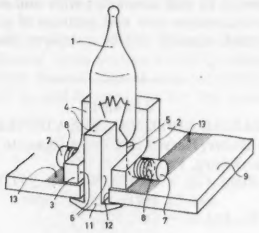
Walter Feldner, Rechtenbach, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 23, 1973, Ser. No. 390,700

Claims priority, application Germany, Sept. 27, 1972, 7235504

Int. Cl. H01r *13/54*; **H05k** *1/04*

U.S. Cl. 339—17 D **4 Claims**



1. A luminaire having a holder and a capless miniature incandescent lamp, an insulating plate having contact elements disposed thereon and carrying said holder, said holder comprising two upright supports cooperatively dimensioned and configured for holding said lamp, connection wires projecting outwards on one side of said lamp and engaging said contact elements on said insulating plate, said holder further comprising two radially projecting studs around which the connection wires of the lamp are wound and which are connected to the contact elements of the plate.

3,864,007

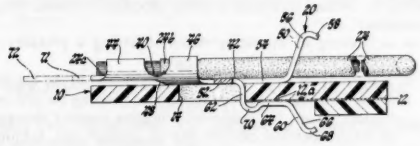
PRINTED CIRCUIT CONNECTOR TERMINAL

Robert G. Plyler, Vienna, and Andrew Russo, Jr., Fowler, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 13, 1973, Ser. No. 388,016

Int. Cl. H01r *9/12*; **H05k** *1/07*

U.S. Cl. 339—17 LC **5 Claims**



1. An electrical connector means comprising, in combination, a printed circuit board having a plurality of conductor strips thereon and a row of through openings spaced wholly inwardly from adjacent side edges of the printed circuit board, terminal means including a carrier strip and a plurality of terminals integrally connected to the carrier strip via webs in a spaced relationship corresponding to the spaced relationship of said through openings whereby said terminals are simultaneously alignable with said through openings, and a wire conductor connected to each terminal, said terminal means being connected to said printed circuit board with said carrier strip and portions of said webs overhanging said terminal board,

each of the terminals having a rearward portion and a forward portion, said rearward portion having a crimping flange which is crimped onto an end of wire conductor wtth the wire conductor overlying said forward portion and said printed circuit board to space said wire conductor from said carrier strip and said overhanging portions of said webs, said forward portion of said terminals including a pair of first laterally spaced fingers having sections engaging a first side of said printed circuit board and a second flexible finger having a first section extending transversely of said first fingers disposed in one of said through openings, a second section extending generally in the same direction as the first fingers biasingly engaging a side of said printed circuit board opposite said first side, at least one of said fingers engaging a contact area of the conductor strips on the circuit board, said terminals being simultaneously connectable with the circuit board by aligning respective terminals with respective openings, moving the second fingers through the through openings and then simultaneously moving the terminals relative to the circuit board so that portions of the circuit board adjacent said openings are slidably received between and biasingly engaged on opposite sides by said first fingers and said second sections of the second fingers, said carrier strip being integral with the rearward portion of the terminals and severable therefrom via said overhanging web portions after the latter are connected to the printed circuit board to separate the individual terminals from each other.

3,864,008

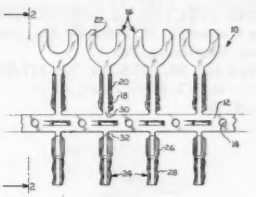
LEAD WIRE ASSEMBLY

Fransiscus C. Bakermans, Shiremanstown, and William C. Thoms, East Berlin, both of Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 7, 1973, Ser. No. 386,410

Int. Cl. H01r *11/08*

U.S. Cl. 339—28 **3 Claims**



1. A lead wire assembly comprising a carrier strip extending along the assembly with a number of wire-securing means extending to one side of the strip at regular intervals therealong, and a plurality of parallel insulated lead wires arranged in side-by-side relation along the length of the strip and extending generally perpendicular to the strip and across the strip with each lead wire associated with a wire-securing means, each wire-securing means including an insulation crimp barrel secured to one end of a lead wire and an open wire crimp barrel with a bared lead wire conductor disposed in the wire crimp barrel and contact means on the other ends of said wires located on the opposite side of said strip.

3,864,009

CONNECTOR AND METHOD

Ralph F. Wickenberg, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 9, 1973, Ser. No. 349,068

Int. Cl. H01r *11/10*

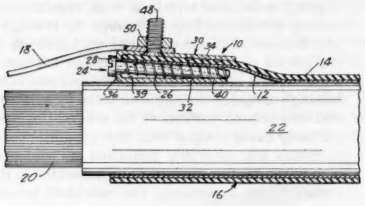
U.S. Cl. 339—95 R **14 Claims**

1. A connector for making an electrical connection to an end of a tubular electrically conductive plastic coated shield with an electrically insulating outer jacket on a communication cable, said connector comprising:

an electrically conductive screw having a head and a generally pointed helically threaded end; and

a generally U-shaped resilient clip having first and second opposed jaws projecting from an interconnecting end wall, said jaws terminating with spaced ends adapted to

receive the conductive shield and jacket therebetween with the first jaw adjacent the inner surface of said shield and said end wall adjacent the end of said conductive shield, said end wall having an opening receiving the threaded end of said screw to project from said end wall between the jaws, said clip including means for guiding the screw along the first jaw and said jaws being spaced to resiliently press said screw against said conductive



shield when said clip is engaged over said jacketed shield to engage the adjacent edges of the threads with the conductive shield, thereby wiping away the plastic coating on the shield as the screw is rotated between the jaws to provide an electrical connection between the screw and the conductive shield, and resiliently retaining said electrical connection after the screw is completely engaged with its head at the end wall.

3,864,010

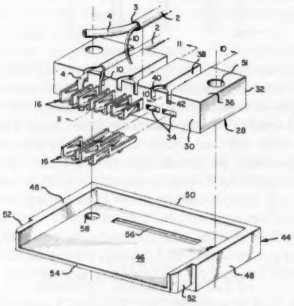
PRE-LOADED ELECTRICAL CONNECTING DEVICE

Henry George Wasserlein, Jr., Seminole, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 30, 1973, Ser. No. 327,966

Int. Cl. H01r *11/20, 13/58*

U.S. Cl. 339—97 R **14 Claims**



1. An electrical connector intended for use with a pair of associated conductors such as a signal conductor and a grounding conductor, said connector being adapted for engagement with complementary connecting means to disengageably connect said associated conductors to further conductors, said connector comprising:

an insulating housing, said housing having a mating face which is proximate, and opposed to, said complementary connecting means when said connector is engaged with said complementary connecting means, said housing having a rearward face on the side thereof which is opposite from said mating face,

a pair of electrical contact terminals in said housing, said terminals having contact portions which extend normally of, and beyond, said mating face, each of said contact portions having a free end, said free ends being generally channel-shaped in cross-section and having a web and sidewalls, each of said free ends having a conductor receiving slot extending inwardly from its web at said free end, and

conductor-receiving passageway means extending through said housing from said rearward face to said mating face whereby upon positioning said conductors in said conductor-receiving passageway means and locating end portions of said conductors in said conductor-receiving slots, said conductors are electrically connected to said contact terminals adjacent to said free ends, and upon engagement of said connector with said complementary connecting means, said end portions of said conductors are located adjacent to said complementary connecting means.

3,864,011

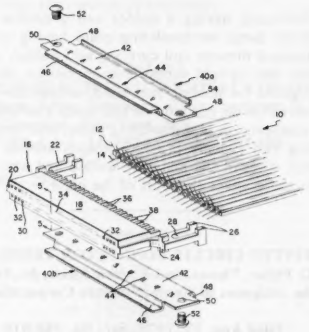
COAXIAL RIBBON CABLE CONNECTOR

John Henry Huber, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 27, 1973, Ser. No. 391,727

Int. Cl. H01r *11/20, 13/46*

U.S. Cl. 339—103 M **1 Claim**



1. A connector for connecting a coaxial ribbon cable of the type having a plurality of signal-carrying conductors and drain wires, to contact elements of other electrical circuits, which comprises:

a. a housing of insulating material having a plurality of cavities extending therethrough;

b. a plurality of contact members positioned in the cavities in the housing, each contact member having on one end contact means for resiliently engaging contact elements of other electrical circuits and on another end, terminal means for receiving either the signal-carrying conductor or the drain wire; and

c. strain relief means for relieving strain on the coaxial ribbon cable which may be terminated therein, said means including two identical halves, each half having a surface containing a plurality of inwardly projecting lances for engaging the coaxial ribbon cable, some of the lances pointing in one axial direction and other of such lances pointing in the opposite axial direction, said halves further having thereon means for being fastened to said housing.

3,864,012

ELECTRICAL CONNECTOR

John M. Cutchaw, 7333 E. Virginia, Scottsdale, Ariz. 85257

Filed Feb. 22, 1974, Ser. No. 444,809

Int. Cl. H01r *13/54;* **H05k** *1/07*

U.S. Cl. 339—176 MP **14 Claims**

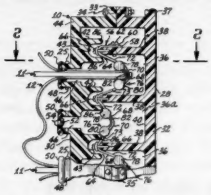
1. A connector for electrically interconnecting flat multiconductor elements such as a printed circuit board having

edge contacts upon which the conductors of a flexible ribbon cable are alignigly positioned, said connector comprising:

a. a housing having at least one connection chamber formed therein and having an elongated slot formed in one wall thereof which opens into the center of the chamber and through which the portions of the multiconductor elements to be electrically interconnected are insertable;

b. a tension band of elastic material mounted within the chamber of said housing and positioned to present one surface in facing coextensive relatinship with the slot of said housing;

c. tension means within the chamber of said housing for deflectively contacting said tension band to apply a tension preload to said band and to form it into a substantially U-shaped cross-sectional configuration with the bight portion thereof aligned and coextending with the slot formed in said housing and the leg portions thereof



forming a diverging included angle therebetween which extends from the bight portion toward the slot of said housing, the extending ends of the leg portions being secured to said housing so that movement of the bight portion away from the slot is produced by deflective engagement of the multiconductor elements when they are inserted therein which will increase the stress of said band and reduce the included angle between the legs of said band by moving the legs toward each other; and

d. cam means mounted on said tension band and positioned thereon so that a portion of said cam means is disposed on each of the leg portions of said band and movable therewith for applying a compression force to the multiconductor elements when they are inserted into the chamber of said housing, the compressive force resulting from the stress of said band and movement of the leg portions which decreases the included angle therebetween.

3,864,013

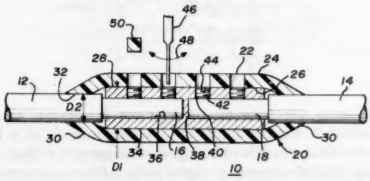
PRE-INSULATED CONNECTOR FOR ELECTRICAL CONDUCTORS

Sidney Levy, Belle Mead, N.J., assignor to Thomas and Betts Corporation, Elizabeth, N.J.

Filed Sept. 19, 1973, Ser. No. 398,664

Int. Cl. H01r *7/12*

U.S. Cl. 339—272 A **6 Claims**



1. A pre-insulated coupling for joining two electrical conductors comprising: a metallic sleeve of a first predetermined length having a passage therethrough proportioned to accept therein the end of an electrical conductor from which the insulation has been removed; an insulating sleeve formed from a given insulating material and having a second predetermined length greater than said first predetermined length, said insulating sleeve having a generally uniform first outer diameter along said first predetermined length, the opposite ends of said insulating sleeve being tapered so as to terminate in a second outer diameter less than said first outer diameter and arranged to provide a smooth transition between the outer surface of said insulating sleeve and the outer surface of the insulation of an insulated electrical conductor inserted within a respective end of said insulating sleeve; said insulating sleeve having a central passage proportioned to receive therein said metallic sleeve, said central passage extending for said first predetermined length; a plurality of apertures extending through said insulating sleeve from the outer surface thereof to said central passage thereof; means coupling said metallic sleeve to the ends of electrical conductors from which the insulation has been removed which have been inserted into said metallic sleeve; and a plurality of plugs formed from said given insulating material, one for each of said apertures, said plugs when inserted into their associated apertures sealing said apertures; the exposed surfaces of said plugs lying flush with the outer surface of said insulating sleeve and providing a continuous insulating sleeve of homogeneous composition about said metallic sleeve.

3,864,014

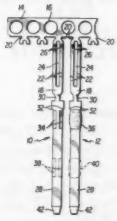
COINED POST FOR SOLDER STRIPE

James Edward Lynch, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 248,964, May 1, 1972, Pat. No. 3,780,433. This application June 11, 1973, Ser. No. 368,808

Int. Cl. H01r *5/04*

U.S. Cl. 339—275 R **6 Claims**



1. An electrically conductive post intended for mounting in a plated-through aperture of a printed circuit board, comprising:

an elongated body of conductive material having a first body portion and a second body portion,

a selected length of said second body portion having a plurality of external surfaces defining a first polyhedral cross-section,

a selected length of said second body portion having external surfaces defining a second polyhedral cross-section of smaller area than the area of said first polyhedral cross-section,

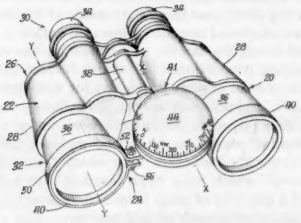
said external surfaces of said second selected length being offset from the external surfaces of said first selected length, and

solder adhered to the external surfaces of said second selected length.

3,864,015
VISUAL BEARING INSTRUMENT

Paul F. Ilg, 4065 Bunker Ln., Wilmette, Ill. 60091

Filed Oct. 26, 1973, Ser. No. 409,925
Int. Cl. G02b 7/00
U.S. Cl. 350—81 6 Claims



1. In a visual bearing instrument including a binocular device comprised of a pair of parallel telescopic housings each having oppositely disposed viewing and objective end portions, the improvement comprising,

a compass having a fixed vertical lubber line and a compass card movable in a horizontal plane relative to the lubber line,

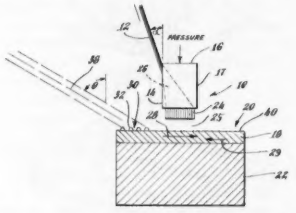
the surface of said compass card opposite the lubber line being in a plane having a vertical component,

and means for mounting the compass on the binocular device with at least an extension of the vertical lubber line in the line of sight of the binocular device whereby the line and indicia on the card are visible from the viewing end portion externally of the binocular device.

3,864,016
HOLOGRAPHIC FIBER TO WAVEGUIDE COUPLER

Mark L. Dakss, Yonkers, and Stanley A. Zemon, New York, both of N.Y., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 10, 1972, Ser. No. 242,491
Int. Cl. G02b 5/14
U.S. Cl. 350—96 WG 13 Claims



3. A device for optically coupling a light-carrying fiber and an optical waveguide in an integrated optical circuit comprising

an optical circuit having an optical waveguide for propagating an optical guided wave,

an optical fiber mounted over the optical circuit to direct a beam in the far field upon a surface of the optical waveguide, and

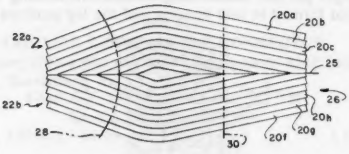
a photo-recording material layer interposed between the optical fiber and the surface of the optical waveguide, said material having a coupling segment in close adjacency to the optical waveguide to receive a portion of the optical waves propagating therealong,

said photo-recording material further being provided with an interference pattern in the coupling segment thereof, said interference pattern formed by light propagating in said optical waveguide interfering with light beam propagating from said optical fiber, to produce a hologram having a conversion function selected to convert the light in the far field propagating from the fiber to that of said optical guided wave.

3,864,017
OPTICAL FIBER ARC-TO-LINE CONVERTER

Henry B. Cole, East Woodstock, Conn., assignor to American Optical Corporation, Southridge, Mass.

Filed May 31, 1973, Ser. No. 365,774
Int. Cl. G02b 5/16
U.S. Cl. 350—96 B 11 Claims



1. An arc-to-line converter comprising

a. An optical fiber array including at least mirror image subassemblies joined together along a plane;

b. each said subassembly including a plurality of lengths of optical fibers bent at a predetermined angle and nested together;

c. each said subassembly being secured to a mirror image subassembly with the legs of the angled fibers contacting along said plane;

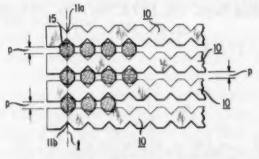
d. one edge of exposed optical fibers being formed into an arcuate plane generally transverse to the axes of said fibers; and

e. the opposite edge of exposed optical fibers being formed into a straight plane generally transverse to the joining plane between said mirror image assemblies.

3,864,018
METHOD AND MEANS FOR SPLICING ARRAYS OF OPTICAL FIBERS

Calvin Max Miller, Lilburn, Ga., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill Heights, N.J.

Filed Oct. 18, 1973, Ser. No. 407,528
Int. Cl. H01r 15/00
U.S. Cl. 350—96 C 7 Claims

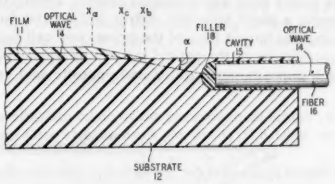


1. An article for permanently locating the ends of a first group of optical fibers in abutting, axial alignment with corresponding ends of a second group of optical fibers, comprising: a thin wafer having parallel flat top and bottom surfaces, each surface having an equal number of spaced parallel optical fiber-receiving longitudinal grooves of uniform cross section, the corresponding grooves of said surface being in vertical alignment, the geometry of each said groove being selected to assure spatial separation between two such articles when enveloping uniform diameter optical fibers therebetween.

3,864,019
OPTICAL FILM-FIBER COUPLER

Gerald Smolinsky, New Vernon, and Ping King Tien, Chatham, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 15, 1973, Ser. No. 415,936
Int. Cl. G02b 5/14
U.S. Cl. 350—96 WG **8 Claims**



1. An arrangement for coupling a wave of optical electromagnetic radiation between a thin-film optical waveguide and a fiber optical waveguide, said thin-film waveguide comprising a transparent substrate, a transparent dielectric film formed on a major surface of said substrate, said film having an index of refraction exceeding that of said substrate and a thickness proportioned for guiding said wave of optical electromagnetic radiation, said fiber waveguide comprising an elongated transparent fiber having cross-sectional dimensions and a refractive index distribution also proportioned for guiding said wave, said arrangement being characterized in that

said film has an end region that is gradually tapered in thickness along the intended path of said wave to be guided therein to a cut-off point at which said film is incapable of supporting said wave as guided mode, said tapered end region providing emergence of said wave from said film along a path in said substrate, and in that said substrate includes a region defining a cavity disposed to intercept the intended path of said wave in said substrate and into which a portion of the length of said fiber is inserted said cavity having an essentially hemispherical end shape and being filled with a transparent filler material having an index of refraction exceeding that of said substrate to form an essentially hemispherical lens in said substrate at the end of said cavity.

3,864,020
LIGHT CONTROLLED LIGHT MODULATOR

John A. Armstrong, South Salem, and Daniel R. Grischowsky, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,337
Int. Cl. G02f 1/16
U.S. Cl. 350—147 **9 Claims**

1. A light controlled light modulator comprising:

a. a coherent rotator containing a material exhibiting Zeeman splitting of the optical spectra of radiations emitted by atomic transitions wherein the population densities of atoms in the Zeeman magnetic sublevels of the ground and excited states are controlled by a circularly polarized driving light beam, and

b. a polarizer oriented to variably transmit a main beam of linearly polarized light as a function of the rotation of the plane of polarization of the main beam by passage through said coherent rotator.

3,864,021
LIQUID CRYSTAL DISPLAY DEVICE AND METHOD FOR PROCESSING THE SURFACE OF ELECTRODE GLASS THEREOF

Yoshio Katagiri, and Yoshio Miyata, both of Sendai, Japan, assignors to Kabushiki Kaisha Daini Seikosha and Kabushiki Kaisha Seikosha, both of Tokyo, Japan

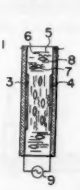
Filed Mar. 6, 1973, Ser. No. 338,625
Claims priority, application Japan, Mar. 8, 1972, 47-23813
Int. Cl. G02f 1/16
U.S. Cl. 350—160 LC **8 Claims**

1. A liquid crystal display device comprising a transparent support material for sandwiching a liquid crystal, said material being coated at least at its surfaces adjacent said liquid crystal, with transparent conductive material adapted for localized application of electric fields to control areas of said liquid crystal display device, and said conductive material being further coated at the surface adjacent said liquid crystal with a rubbed layer of fluorocarbon polymer, selected from group consisting of fluorinated polyolefins and their copolymer, rubbed in a predetermined direction.

3,864,022
COLOR SWITCHING LIQUID CRYSTAL DISPLAY

Akio Moriyama, Katano; Masakazu Fukai, Nishinomiya, and Komei Asai, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 18, 1973, Ser. No. 425,857
Claims priority, application Japan, Dec. 19, 1972, 47-127848
Int. Cl. G02f 1/16
U.S. Cl. 350—160 LC **10 Claims**



1. A color switching liquid crystal display comprising:

a liquid crystal element formed of a nematic liquid crystal which in the absence of an electric field exhibits a homeotropic arrangement and has a negative dielectric anisottropy, and including at least two kinds of dyes of different light absorption at least one of which is a pleochromatic dye, and at least two of which exhibit mutually different display action characteristics under the effect of an electric field; and

means for applying an electric field to said liquid crystal element.

3,864,023
ELECTRO-OPTICAL DISPLAY DEVICE

Hans-Joachim Glaser; Gunther Graw, and Karl-Heinz Makowicki, all of Gelsenkirchen, Germany, assignors to Flachglas Aktiengesellshaft DELOG-DETAG, Gelsenkirchen, Germany

Filed Jan. 2, 1974, Ser. No. 429,897
Claims priority, application Germany, Jan. 9, 1973, 2300856
Int. Cl. G02f 1/16
U.S. Cl. 350—160 LC **10 Claims**

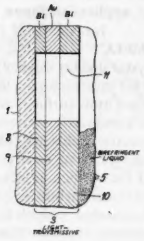
1. An electro-optical display device comprising:

wall means forming a closed chamber, said wall means including a light-transmissive plate;

a pair of electrodes integral with said wall means confronting each other across said chamber, one of said electrodes

being a discontinuous light-transmissive coating on an inner surface of said plate forming a pattern to be displayed;

a liquid crystal in said chamber contacting said electrodes; and



circuit means for energizing said electrodes;

said coating consisting of a plurality of superposed metallic layers including a bonding layer of bismuth adhering to said inner surface and a highly conductive layer of noble metal adhering to said bonding layer.

3,864,024

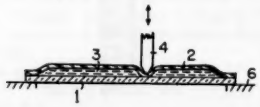
OPTICAL DISPLAY DEVICE

Gust A. Olson, 2030 Manning Ave., Los Angeles, Calif. 90025

Filed Mar. 26, 1973, Ser. No. 345,170

Int. Cl. G02f *1/36*

U.S. Cl. 350—161 **13 Claims**



1. A selectively changeable optical display, comprising;

a. a transparent solid layer (1),

b. a coextensive flexible layer (2) spaced from said solid layer, said flexible layer having a given reflectance property,

c. an opaque quasi-liquid layer (3) interposed exclusively between said solid layer and said flexible layer, said opaque layer having a reflectance property optically contrasting to said given reflectance property, and

d. selectable external means to bear (4) upon selected portions of said flexible layer to correspondingly displace said opaque layer,

whereby the contrasting reflectance property of said flexible layer is selectively displayed for viewing through said solid layer.

3,864,025

DISPLAY INSTRUMENT USING OPTICAL COLLIMATION

Bernard Picardat, Paris, France, assignor to Thomson-CSF, Paris, France

Filed May 23, 1973, Ser. No. 363,156

Claims priority, application France, May 26, 1972, 72.18882

Int. Cl. G02b *27/10*

U.S. Cl. 350—174 **3 Claims**

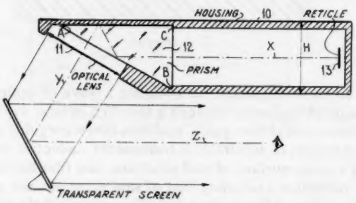
1. A display instrument using optical collimation for projecting data into the observer's normal line of sight, said instrument comprising:

a transparent combining glass positioned in said line of sight and having a surface for reflecting projected images into said line of sight;

an optical objective for projecting images of luminous objects focused at infinity onto said surface;

means for providing said luminous objects; and

a reflectively deflecting prism located between said optical objective and said luminous objects providing means, said prism having an entry face for refracting incident light rays issued from said luminous objects; a reflecting face forming a plane reflective mirror and an exit face comprising the largest face of the prism, said exit face being perpendicular to the optical axis of said optical objective which is positioned parallel and opposite said exit face,



said luminous objects being positioned in the focal zone of said objective through said prism, said entry face being perpendicular to the optical axis which extends through said prism to said focal zone, the angles of said prism adjacent to said exit face having predetermined values and the ratio of the angle formed with the reflecting face to that formed with the entry face being equal to 1:2 for providing emerging rays which form with the normal to the exit face angles which are respectively the same as those which the corresponding incident rays issued from said objects make with the normal to the entry face, whereby the diameter of the optical objective is greater than the breadth of the entry face and corresponds to the emergent area of said exit face.

3,864,026

WIDE ANGLE PHOTOGRAPHIC LENS

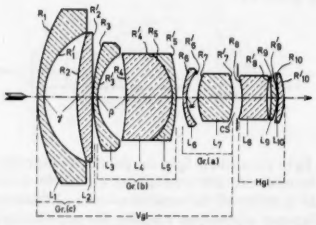
Erhard Glatzel, Heidenheim, Germany, assignor to Carl Zeiss Stiftung (a.k.a. Carl Zeiss), Heidenheim on the Brenz, Wurttemberg, Germany

Filed Sept. 19, 1973, Ser. No. 398,774

Claims priority, application Switzerland, Sept. 21, 1972, 13917/72

Int. Cl. G02b *9/00, 1/00*

U.S. Cl. 350—214 **13 Claims**



1. A wide angle lens system with a relatively long back focus on the image side and a relatively large angle of view, comprising a rear member behind an aperture space and a front member in front of said aperture space, said rear member comprising at least three lens elements each with air on both sides, the forward element adjacent said aperture space being a negative element followed in a rearward direction by two positive

elements, said front member comprising at least three groups of lens elements, each group having a negative component at the front of the group and a positive component rearwardly of such negative component, the negative component and positive component of each group enclosing between them a diverging-acting air space constituting a negative air lens, each of said air lenses having a more strongly diverging glass-air surface which is concave toward an image at the rear of the lens system, the successive groups in order from the aperture space forwardly being respectively designed Gr. (*a*) and Gr. (*b*) and Gr. (*c*), the lens elements being so constructed that:

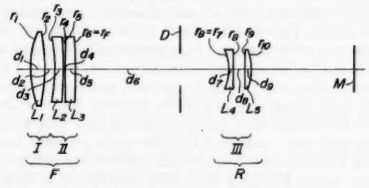
1. The paraxial focal length (f_a) of the rearmost group Gr. (*a*) of the front member is between the limits of 1.134 times and 2.055 times the equivalent focal length (F) of the entire lens system.
2. The absolute value of the paraxial focal length (f_b) of the group Gr. (*b*) is between the limits of 8.148F and 2.433 F.
3. The numerical value of the paraxial focal length ($f_{c,b}$) of the combination of the two groups Gr. (*c*) and Gr. (*b*) has an absolute value between the limits of 2.40 F and 5.373 F.

3,864,027

TELEPHOTO LENS SYSTEM HAVING SMALL OVERALL LENGTH

Kenichi Harada, Tokyo, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed May 8, 1973, Ser. No. 358,366
Claims priority, application Japan, May 10, 1972, 47-46086
Int. Cl. G02b *9/60, 9/36*
U.S. Cl. 350—216 **4 Claims**



1. A telephoto lens system having a small overall length, which is constructed by three components and five lenses and comprises a front lens group and a rear lens group separated by a diaphragm space, said front lens group consisting of a biconvex first component that has its object side a convex surface having a large curvature and a negative second component that has its object side a concave surface having a large curvature and that consists of two negative lenses, said rear lens group consisting of a negative lens and a positive lens and constituting a third component composed of a negative lens that has its object side a concave surface having a large curvature followed by a positive lens that has its image side a convex surface having a large curvature, and which is defined by the following five conditions, i.e.,

1) $(0.9/f) < (n_1-1/r_2) + (1-n_2/r_3) < (1.3/f)$,
2) $-0.07 < (r_B/r_F) < 0.1$,
3) $0.01f < d_2 < 0.05f$,
4) $0.07 < f_1/f_3 < 0.35$, and
5) $0 < (f_3 - f_2/f) < 3$

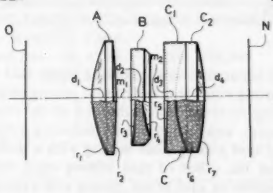
where d_2 is an air space between the first and second components r_2 to r_3 are radii of curvature of the front and rear surfaces of the first component, r_3 is a radius of curvature of the front surface of the second component, f is an overall focal lenth of the total lens systems, f_1, f_2 and f_3 are focal lengths of the first, second and third lenses counted from the object side, respectively, n_1 and n_2 are refractive indexes of the first and second lenses, respectively, r_F is that surface of the two lens surfaces bounding a diaphragm space which is located at the object side, and r_B is that surface of the two lens surfaces bounding the diaphragm space which is located at the image side.

3,864,028

THREE COMPONENT REPRODUCTION OBJECTIVE

Miloslav Paukert, Prerov, and Libuse Schwarzova, Pencicky, both of Czechoslovakia, assignors to Meopta, narodni Podnik, Prerov, Czechoslovakia

Filed June 7, 1973, Ser. No. 367,822
Claims priority, application Czechoslovakia, June 13, 1972, 4092-72
Int. Cl. G02b *9/20*
U.S. Cl. 350—227 **2 Claims**



1. A lens system for reproduction comprising three components axially arranged in such a manner that the first component nearest the image-plane side is a simple biconvex element, the second component being in the middle is a simple biconcave element, and the third component nearest the objective-plane side is a cemented concave-convex lens composed from a biconcave element and a biconvex element, said system complying with the following conditions:

		n_d	ν
$r_1 = +$ 27.36	$d_1 = 4.55$	1.62041	60.3
$r_2 = -1978.05$	$m_1 = 4.36$	air	
$r_3 = -$ 62.69	$d_2 = 1.65$	1.59551	39.2
$r_4 = +$ 25.3	$m_2 = 5.23$	air	
$r_5 = -$ 142.92	$d_3 = 1.74$	1.53172	48.9
$r_6 = +$ 28.52	$d_4 = 6.59$	1.65844	50.8
$r_7 = -$ 41.81			

where

$r_1 - r_7$ are the radii of curvature of the individual refracting surfaces
$d_1 - d_4$ are the axial thicknesses of the individual components and elements thereof
m_1 and m_2 are the airspaces between the individual components
n_d is the refracting index for the spectral D-line

and ν is the Abbe number.

3,864,029

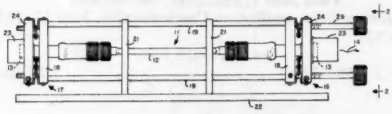
LASER MIRROR MOUNT AND WINDOW PROTECTION ASSEMBLY

Galen E. Mohler, Mountain View, Calif., assignor to Lexel Corporation, Palo Alto, Calif.

Filed Aug. 29, 1973, Ser. No. 392,614
Int. Cl. G02b *5/08*
U.S. Cl. 350—288 **11 Claims**

1. In a laser which includes an an elongated envelope enclosing a lasable medium and having a window at an end thereof for the passage therethrough of optical energy along an optical axis, an optical reflector positioned transversely of said optical axis exteriorly of said envelope to intercept optical radiation emanating from said window, mounting structure for said optical reflector which allows the angular orientation of the same to be accurately adjusted relative to said optical axis,

and a tubular cover enclosing the path for optical energy along said optical axis between said envelope and said reflector, said cover having opposite ends respectively secured to said envelope about said window and to said mounting structure and including a tubular ball joint along its length permitting changes in the angular orientation of said mounting structure with respect to said envelope and, hence, said optical axis, said tubular cover including a pair of coaxial tubes joining one another at adjacent ends and having their opposite ends re-



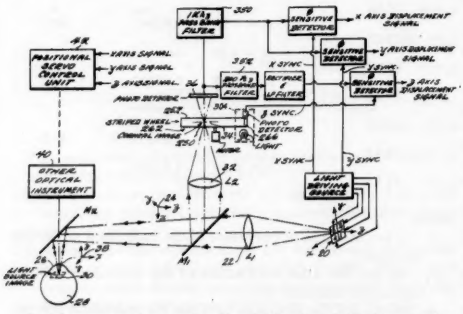
spectively secured to said envelope about said window and to said mounting structure, one of said joining ends of one of said tubes being received within the end of the other end of said tubes thereat, and said ball joint including a rigid ball surface on one of said joining ends mating with a deformable elastic portion on the other of said joining ends, said deformable elastic portion of said other joining end extending axially of said tube beyond said rigid ball surface whereby axial movement of said ball in said other end is accommodated.

3,864,030

EYE POSITION MEASURING TECHNIQUE

Tom N. Cornsweet, Washington, D.C., assignor to Acuity Systems, Incorporated, McLean, Va.

Filed July 11, 1972, Ser. No. 270,639
Int. Cl. G01c *3/08*
U.S. Cl. 351—7 **15 Claims**



1. An eye position measuring device for detecting relative eye position by measuring reflections from the eye's cornea, said device comprising:

source means for selectively providing light energy emanating from different ones of at least two physically distinct positions and for providing a synchronization signal representative of the sequence with which light is caused to emanate from the distinct positions,

light transmitting means for directing said light energy onto said cornea,

light receiving means for collecting a portion of said light energy after reflection from said cornea,

photodetecting means for converting reflected light passed by said receiving means into a photodetector output signal, said photodetecting means being aligned with the receiving means to provide substantially equal illumination thereof due to light emanating from either of said distinct positions when the cornea center is in alignment with an optical axis of said receiving means, and

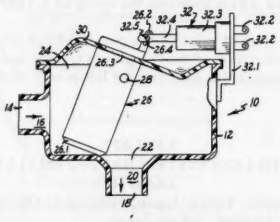
phase sensitive detecting means electrically connected to said source means and to said photodetecting means for comparing the phase of said photodetector output signal with that of said synchronization signal to thereby provide a signal representing the relative direction of cornea displacement from an aligned position and hence representative of a corresponding relative eye position.

3,864,031

FLUID CONTROL VALVE

Roderick J. Hossfeld, Northampton; Paul E. Tartaglia, Amherst, and Daniel R. Pimentel, Seekonk, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 11, 1973, Ser. No. 368,922
Int. Cl. F16k *31/10*
U.S. Cl. 251—138 **2 Claims**



1. A valve device comprising a valve body having an inlet passage including an inlet opening and an inlet chamber, having an outlet passage extending from one side of said chamber, having a valve seat between said outlet passage and chamber at said one side of said chamber, and having an aperture at the opposite side of said chamber from said valve seat, a valve member having a plug portion to be engaged with said valve seat for closing said valve device and having a stem portion extending into said body aperture, means on said valve body pivotally mounting said valve member for movement between the closed valve position having said plug portion engaging said valve seat and an open valve position having said plug portion spaced from said valve seat, said pivotal mounting means engaging said valve member at a location spaced from said valve seat for permitting fluid flow in said inlet passage over said valve seat to urge said valve member to said closed valve position with selected force, a flexible diaphragm secured in sealing relation to said stem portion and to said valve body around said aperture for sealing said valve body with minimal interference with said pivotal movement of said valve member, and an electrically operable actuator means mounted on said valve body exteriorly thereof and operatively connected with said stem portion for selectively moving said valve member from said closed valve position to said open valve position against said force when said actuator means is electrically energized.

3,864,032

PROJECTION OPTICAL DEVICE FOR MICROREADERS CAPABLE OF VARYING MAGNIFICATION

Nobuyuki Yanagawa, Kanagawa-ken, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1973, Ser. No. 355,021
Claims priority, application Japan, May 2, 1972, 47-43313
Int. Cl. G03b *21/22*
U.S. Cl. 353—76 **3 Claims**

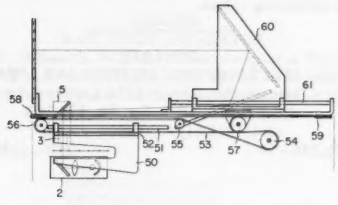
1. In a microreader of the type having:

a. a projection screen fixed with respect to a support;

b. information means containing an array of information to be read; and

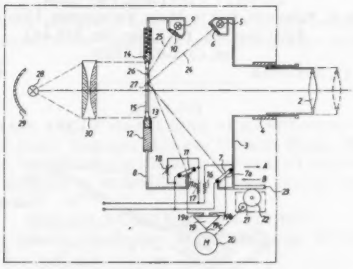
c. optical means for projecting an information image from said information means onto said projection screen; the improvement wherein said optical means is capable of varying its magnification and comprises:

d. projection lens means mounted on said support for movement along said information means and including a first reflector for projecting the information image;
e. reflector means mounted on said support for movement in the same direction as said projection lens means and including second and third reflectors for receiving the information image projected by said first reflector and displacing and reversing the direction of the information image projection onto the projection screen; and
f. drive means for moving said projection lens means and said reflector means in synchronism with a displacement ratio of **2:1**, said drive means comprising:



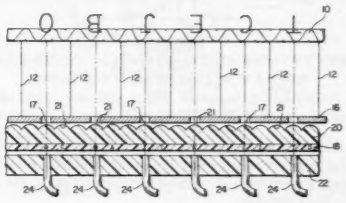
i. four pulleys fixed on said support;
ii. a movable pulley connected to said reflector means for movement therewith;
iii. wrapping connector means trained respectively about two of said fixed pulleys, said movable pulley and the remaining two fixed pulleys;
iv. means for rotating one of said fixed pulleys; and
v. means for fixing another one of said fixed pulleys against rotation and for adjusting its position about its rotational axis to permit movement of said reflector means independently of said projection lens means.

3,864,033
AUTOMATIC FOCUSING ARRANGEMENT FOR A SLIDE PROJECTOR
Alois Rieder, Munich, Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed May 25, 1973, Ser. No. 364,079
Claims priority, application Germany, May 27, 1972, 2225972
Int. Cl. G03b *3/10;* **G01j** *1/16*
U.S. Cl. 353—101 **9 Claims**



1. In a slide projector adapted to project a slide and having a projector lens and slide holding means for holding said slide, the relative positions of said projector lens and slide holding means being changeable with respect to each other, an automatic focusing arrangement, comprising, in combination, first opto-electrical means mounted in a fixed position relative to said projector lens for impinging a first light beam onto said slide holding means and creating a first test signal in dependence upon the position of the corresponding light beam reflected by said slide; second opto-electrical means mounted in a fixed position relative to said slide for impinging a second light beam onto said slide and creating a second test signal in dependence upon the position of the corresponding light beam reflected by said slide; regulator means connected to said first and second opto-electrical means, for furnishing a control signal in response to said first and second test signals; and moving means for changing the position of said projector lens relative to said slide holding means under control of said control signal.

3,864,034
MICROFICHE AND READER
George J. Yevick, Leonia, N.J., assignor to Personal Communications, Inc., Stamford, Conn.
Filed Nov. 28, 1972, Ser. No. 309,968
Int. Cl. G03b *23/08*
U.S. Cl. 353—120 **5 Claims**



1. A microfiche adapted for use on a micro optical viewer, said microfiche including:
a. a transparent sheet,
b. said sheet carrying stored micro optical information distributed over its area,
c. one surface of said sheet including a plurality of optically active elements each of which is adapted to function as a lens, said elements being spaced parallel from said stored information,
d. said micro optical information defined by a plurality of information sets, each information set corresponding to a unique macro scene, each information set occupying dispersed areas interlaced with but distinct from the dispersed areas occupied by any other information set, each unique macro scene corresponding to a unique set of said active elements, each of the dispersed areas of an information set having its own active element and being in optical correspondence therewith.

3,864,035
SHUTTERLESS CAMERA SYSTEM
Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.
Filed Sept. 14, 1973, Ser. No. 397,309
Int. Cl. G03g *15/00*
U.S. Cl. 355—14 **23 Claims**

1. A shutterless camera for recording a scene on electrophotographic film having a photoconductive coating, said camera comprising:
A. a camera housing providing a light-tight enclosure,
B. a wall of said camera housing having projecting means for projecting an exterior light pattern through the wall and into said enclosure,
C. means for removably mounting an electrophotographic film member having a photoconductive coating within said enclosure in a position such that the light pattern will be projected onto the photoconductive coating.

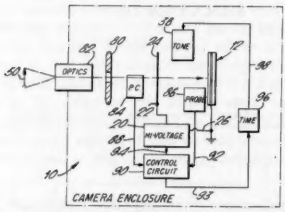
D. a charging device for charging the coating to raise the surface potential thereof rapidly while the coating simultaneously is exposed to said light pattern,

E. means within the enclosure for toning the latent image which is adapted to be produced by the projection of said pattern onto said coating,

F. means for measuring the surface potential of the coating at an area which achieves the peak voltage first of all areas of the coating and deriving a first electrical signal representative of said potential,

G. means for measuring the average intensity of said light pattern and deriving a second electrical signal representative of said intensity,

H. means for comparing the first and second signals while the charging device is enabled and deriving a third electrical signal when a predetermined relationship between the first and second signals has been reached which represents a desired peak voltage corresponding to the particular light intensity,



I. means for disabling the charging device,

J. structure energized by said third signal for operating the last-mentioned disabling means,

K. means for enabling the toning means immediately after operation of said last-mentioned disabling means such that the toning of the latent image commences immediately after the peak voltage has been reached,

L. means for disabling the toning means after a period of time and

M. the camera including means for manually initiating the operation of the charging device when it is desired to commence the recording of a scene.

3,864,036

APPARATUS FOR CONTROLLING EXPOSURE

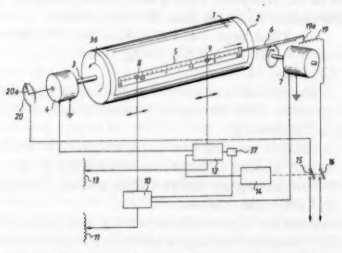
Jacques Vanheerentals, Schoten, Belgium, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 13, 1974, Ser. No. 450,619

Claims priority, application Germany, Mar. 17, 1973, 2313349

Int. Cl. G03b *27/76*

U.S. Cl. 355—68 **21 Claims**



1. In an apparatus for controlling the exposure of variable-contrast photo-sensitive material which is exposed to light passing through an original in two colors, and whose gradation is different for each of said colors, a combination comprising electronic timer means having adjusting means for selecting the total exposure time to light in said colors, determined on the basis of the contrast grade of said photo-sensitive material; operating means for selecting the ratio of exposures to light in said colors within said total exposure time; first exposure selecting means having calibrating values determined by the desired contrast of the photo-sensitive material; second exposure selecting means having calibrating values determined on the basis of the minimum and maximum densities of said original, and connecting means connecting said operating means and said first and second exposure selection means and being operative to automatically select said ratio on the basis of said calibrating values.

3,864,037

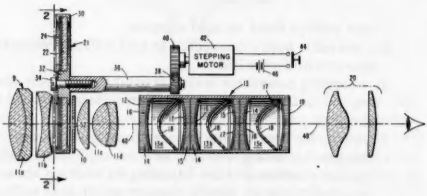
IMAGING SPECTROSCOPIC METHOD AND APPARATUS

Quentin S. Johnson, P.O. Drawer 1334, Leesburg, Va. 22075

Filed Jan. 3, 1973, Ser. No. 320,734

Int. Cl. G01J *3/00*; **H01J** *31/50*

U.S. Cl. 356—74 **26 Claims**



1. An imaging spectroscope comprising:

a light attenuating narrow band pass optical filter adapted to pass wavelengths of light energy within a restricted spectral band and to block substantially all wavelengths of light energy outside of said band;

means to form an image of an object or scene under observation solely with light energy passing said filter; and

means to intensify said image to a level adequate for spontaneous and direct visual observation, said intensifying means being sensitive at least to light energy throughout the entire wavelength range of visible light.

3,864,038

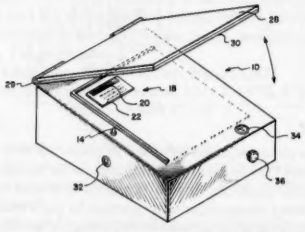
DENSITY CONTROL PRINTER

James C. Palazzolo, 902 N. Main, Farmington, Utah 84025

Filed Sept. 18, 1973, Ser. No. 398,442

Int. Cl. G03b *27/04*

U.S. Cl. 355—114 **4 Claims**



1. A density control and identification printer for transferring a density control strip and identifying information to an unexposed portion of exposed X-ray film comprising:

a printing chamber and energy storing and releasing means contained within said chamber for transmitting a constant and reproducible amount of light energy,

a translucent window positioned in the top wall of said chamber wherein one section of said window contains a graded film density strip and the remaining segment of said window provides space to receive an identification card containing identifying information, said film density strip being characterized by a series of graded densities which, when transferred to said X-ray film, will provide information as to whether said X-ray film has been properly processed and/or whether the X-ray film was properly exposed.

3,864,039

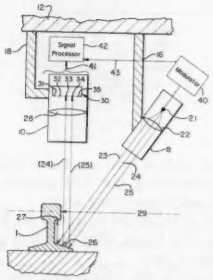
RAIL GAGE APPARATUS

Robert W. Wilmarth, Wellesley, Mass., assignor to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed July 12, 1973, Ser. No. 378,510

Int. Cl. E01b *35/10*; **G01b** *11/14*

U.S. Cl. 356—172 **4 Claims**



1. Rail gage apparatus comprising in combination with a wheeled vehicle for traveling along two rails having opaque rail heads:

light projection means mounted on said vehicle illuminating the base of both of the rails;

light receiver means positioned above said opaque rail heads but not in physical contact therewith such that the amount of reflected light received is dependent upon the shadows cast by the positions of the gage side of said opaque rail heads; and

means for converting said received light into continuous positional data signals representing the gage between rails.

3,864,040

PHASE ANGLE MEASURING ARRANGEMENT

Gabriella Fuchs Viniczay, Steinach; Wilhelm Hutter, Roggwil/TG, and Rudolf-Karl Bohme, Goldach, all of Switzerland, assignors to Aktiengesellshaft Adolf Saurer, Arbon, Switzerland

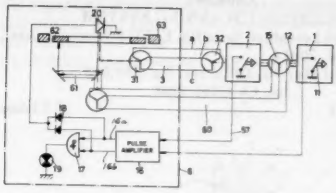
Filed Oct. 29, 1973, Ser. No. 410,369

Claims priority, application Switzerland, Oct. 27, 1972, 15711/72

Int. Cl. G01r *25/00*

U.S. Cl. 356—24 **5 Claims**

1. In equipment having a rotating shaft, synchronizing signal furnishing means for furnishing synchronizing signals under control of said shaft, and reference signal furnishing means directly coupled to said shaft for furnishing reference signals when said shaft is in a predetermined angular position, an arrangement for measuring the phase angle between said synchronizing signals and said reference signals, comprising, in combination, stationary projection disk means; transducing means for converting said reference signals and said synchronizing signals into, respectively, first and second light beams; and projection means rotating substantially in synchronism with said shaft, for projecting said first and second light beams



onto said stationary projection disk means in such a manner that a first and second light spot is created on said projection disk means in response to said first and second light beams respectively, the angular distance between said first and second light spots constituting a measure of said phase angle.

3,864,041

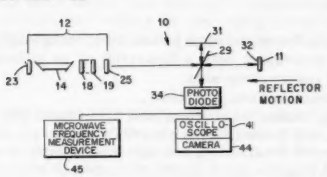
DOPPLER-SHIFT VELOCITY MEASUREMENT SYSTEM USING A TWO-FREQUENCY LASER

James R. Long, Danville, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed June 6, 1973, Ser. No. 367,683

Int. Cl. G01p *3/36*

U.S. Cl. 356—28 **3 Claims**



1. A system for determining the velocity of a moving object, including:

a reflector included on said object;

a two-frequency laser for developing frequency gain peaks for emission of light at first and second original frequencies f_1 and f_2 to impinge on said reflector and be reflected therefrom;

a square law light detector, said detector being a photodiode;

means for directing light emitted from said laser and light reflected from the object to said detector, the frequencies of said light at frequencies f_1 and f_2 being reflected from said object and Doppler-shifted to a third frequency f_1' and a fourth frequency f_2', respectively, according to the velocity of said object;

means connected to said detector for indicating a difference frequency $(f_1' - f_2)$, said means connected to said detector including an oscilloscope for displaying as a trace the difference frequency $(f_1' - f_2)$, and a camera for permanently recording the oscilloscope trace; and

means for determining the difference between said second frequency f_2 and said first frequency f_1,

the difference frequency $(f_1' - f_2)$ added to the difference between the frequencies f_2 and f_1 being a measure of the velocity of the object,

said laser being selected to produce frequencies f_1 and f_2 relative to the estimated velocity of said object so that all difference frequencies between the frequencies f_1, f_2, f_1' and f_2', other than the difference frequency $(f_1' - f_2)$ are

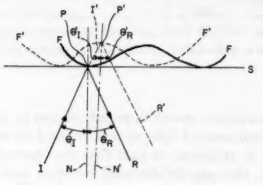
outside the range of response of said detector and said oscilloscope.

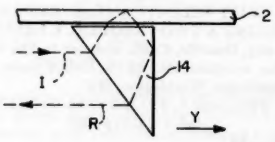
3,864,042

FINGERPRINT SCANNING SYSTEM

Stephen Richard Leventhal, Suite 506 E, 7315 Wisconsin Ave., Bethesda, Md. 20014

Filed May 10, 1973, Ser. No. 359,008
Int. Cl. G06k *9/08*
U.S. Cl. 356—71 **2 Claims**





1. A system for producing a pattern comprising ridges and troughs in accordance with a fingerprint of an individual's finger, said system comprising:

a. light source means;

b. scanner means for scanning said light source over said finger, said scanner means comprising first means including a prism for scanning said light source along one axis of said finger; second means positioned to receive the light from said first means, for directing the light to said finger along a path such that said light is reflected by said finger and for directing the light reflected by a ridge in said finger along said predetermined path, wherein the light reflected by a trough is directed along other paths; and driver means for driving said second means such that said light source is scanned along a second axis of said finger;

c. detector means for detecting the light from said light source means reflected along a predetermined path by said finger;

d. output means, coupled to said detector means, for reproducing said pattern of ridges and troughs in accordance with the light detected by said detector means, wherein said pattern corresponds to the fingerprint of said finger.

3,864,043

ANGULAR DEVIATION MEASURING DEVICE AND ITS METHOD OF USE

James T. Russell, Richland, Wash., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

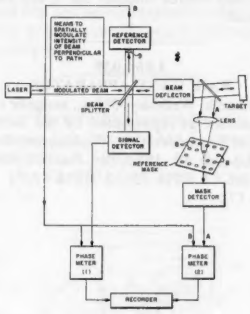
Continuation-in-part of Ser. No. 302,959, Nov. 1, 1972, abandoned. This application Nov. 30, 1973, Ser. No. 420,509
Int. Cl. G01b *11/26*
U.S. Cl. 356—152 **9 Claims**

1. A system for determining angular deviations of a device comprising:

a source of a spatially modulated electromagnetic beam that has its intensity modulated substantially perpendicular to the transmission path of the beam:

a reference detector placeable in the path of the beam for determining the spatial modulation phase of a beam section;

a deflector placeable in the path of the beam for directing the beam through various angular orientations corresponding to specific orientation settings of the deflector; means placed in the beam path for diverting a first portion of the beam after it is deflected;



a reference mask with at least one beam transmitting area; means for transmitting the first portion of the beam through the mask transmitting area;

a reference mask detector for detecting the spatial modulation phase in the beam after the first portion passes through the mask; and

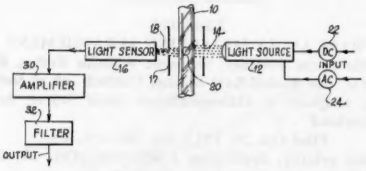
means for comparing the phase difference between the reference detector and mask detector to allow for the determination of the angular deviation of the deflector from a prior reading for the same deflector setting.

3,864,044

METHOD AND APPARATUS FOR THE ANALYSIS OF A DISPERSED PHASE CAPABLE OF TRANSMITTING AND FOCUSING LIGHT

Norman A. Lyshkow, Chicago, Ill., assignor to Combustion Equipment Associates, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 309,644, Nov. 27, 1972, abandoned. This application May 7, 1973, Ser. No. 357,901
Int. Cl. G01n *21/22*
U.S. Cl. 356—201 **31 Claims**



1. Apparatus for analysis of a dispersed phase capable of transmitting and focusing light contained in a continuous phase capable of transmitting light, comprising chamber means adapted to contain the dispersed phase and the continuous phase, a light source positioned to pass a wide beam of light through the chamber means, means associated with the light source to generate the light beam with a component of varying intensity, light sensing means adapted to detect differences in light intensity positioned to receive a portion of the light beam passed through the chamber means whereby the

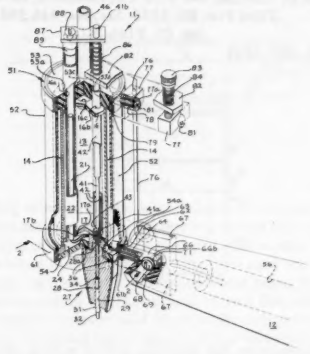
dispersed phase is passed through the beam of light to focus the beam of light onto the light sensing means to cause an increase in the intensity of the light beam striking the light sensing means to activate the light sensing means for each dispersed phase in the continuous phase.

3,864,045

WAXING TOOL

Billy C. Hudson, 948 Coronado Way, Livermore, Calif. 94550

Filed May 15, 1973, Ser. No. 360,564
Int. Cl. B67d *5/62*
U.S. Cl. 401—1 **10 Claims**



1. In a waxing tool, a body portion including means defiining a reservoir for holding wax, electrically energized heating means disposed within the reservoir for melting the wax, a nozzle mounted at the bottom of the reservoir having an axially extending passageway communicating with the reservoir, a needle valve member disposed coaxially of the passageway and movable between advanced and retracted positions for controlling the flow of wax through the nozzle, said valve member extending outside the reservoir at the top thereof, an elongated handle pivotally attached to the body portion for movement in a plane extending radially of the axis of the nozzle whereby the angle between the axis of the nozzle and the axis of the handle can be varied, a control lever pivotally mounted on the body portion for movement about a radially extending pivot in a plane generally normal to the plane of handle movement, one end of the lever extending toward the junction of the handle and the body portion, whereby the lever can be operated by the hand of an operator gripping the handle, and means connecting the control lever to the valve member externally of the reservoir whereby the position of the valve member is controlled by the lever.

3,864,046

MECHANICAL PENCIL, ESPECIALLY FOR THIN LEADS

Kemal Butka, 372 Central Park West, New York, N.Y. 10025

Continuation-in-part of Ser. No. 333,148, Feb. 16, 1973, abandoned. This application Nov. 29, 1973, Ser. No. 420,172
Int. Cl. B43k *21/02*
U.S. Cl. 401—53 **8 Claims**

1. In a mechanical pencil, especially for thin leads, a combination comprising elongated tubular casing means having a lower end; resilient clamping means arranged substantially coaxially within said casing means spaced from said lower end and movable between normally open position in which it is disengaged from a lead passing through said clamping means and a clamping position in which it clamps said lead, said clamping means including a connecting portion remote from said lower end and a plurality of circumferentially spaced force-multiplying arms extending from said connecting portion towards said lower end and defining in the region of said connecting portion a lead passage; tubular lead guide means projecting coaxially beyond the lower end of the tubular casing means and being guided therein movable in axial direction, said tubular lead guide means being constructed for frictionally engaging a lead passing through said clamping means and said tubular lead guide means; transmission means between said tubular lead guide means and said clamping means for transmitting, during writing or drawing and exertion of axial

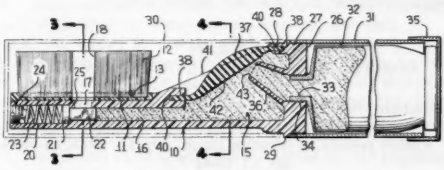
pressure and slight inward movement of the tubular lead guide means, a corresponding pressure to said arms of said clamping means to move the latter to said clamping position in which said arms multiply the applied force and engage the lead in said lead passage with an increased force, so as to prevent inward movement of the lead; and restoring means for moving said lead guide means upon cessation of said axial pressure in outward direction relative to said casing means while said clamping means return to said open position thereof.

3,864,047

TOOTHBRUSH WITH RESILIENT PUMP FOR SUPPLYING PASTE TO BRUSH

James A. Sherrod, P.O. Box 84, Pavo, Ga. 31778

Filed May 23, 1974, Ser. No. 472,671
Int. Cl. A46b *11/04*
U.S. Cl. 401—278 **8 Claims**



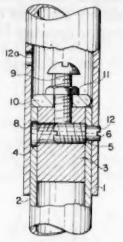
8. A paste dispensing toothbrush or the like comprising a body portion having a paste holding chamber and a paste inlet nozzle projecting into the chamber and connectable to an external paste source, a brush head secured to the body portion and having a paste receiving cavity, the body portion having a paste outlet passage interconnecting said chamber and brush head cavity, a pressure responsive valve element on the body portion normally blocking communication between the brush head cavity and said outlet passage and opening in response to increasing pressure in said chamber and outlet passage, and a manually operable control element on the body portion having a normal position away from said nozzle and a use position in contact with the nozzle and blocking the nozzle, said control element when in the use position diminishing the volume of said chamber and thereby compressing paste therein to cause opening of the pressure responsive valve element and dispensing into said brush head cavity a measured amount of paste.

3,864,048

QUICK-ACTING RELEASABLE TUBE CONNECTORS

Alene McCall Parker, Rt. 1 Box 23, Windsor, N.C. 27983

Filed Nov. 17, 1972, Ser. No. 307,342
Int. Cl. F16b *7/10*
U.S. Cl. 403—27 **10 Claims**



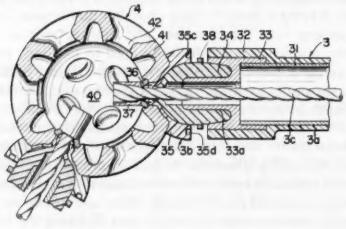
1. Apparatus comprising inner and outer telescopically interfitting tubular sections having a common longitudinal axis, said outer section having a plurality of regularly- and axially-spaced radial holes in and through its walls, said inner section also having a plurality of axially-spaced radial holes in and through its walls and spaced differently from the spacing of the holes in said outer section, all said holes being the same diametral size, a plug entirely fitting within and axially adjustable in and along said inner section, bayonet slot means formed on one end of said plug, said plug having a bore extending diametrically thereacross, generally cylindrical latch means movably fitting within said bore and having an outer end of reduced diametral size to smoothly fit within and extend through any selected registering pair of radial holes in and through said sections, said reduced outer end forming an annular shoulder with the body of said latch means, actuating means within said bore operaable to move said latch means radially outwardly along said bore, from a first position entirely within said plug, outwardly to a second and latching position with its reduced end extending through any selected registering pair of holes in said sections and in registration with said bore, to thus releasably lock said sections in selected telescopic relation, and abutment means cooperating with said shoulder on said latch means, positively limiting radially outward movement thereof in said second position.

3,864,049

CONSTRUCTION ELEMENTS OF UNDERWATER TRUSSES

Taisaburo Ono, No. 2-39, 2-chome, Shinjuku, Zushi, Japan

Filed June 11, 1973, Ser. No. 368,537
Claims priority, application Japan, Jan. 11, 1973, 48-5524
Int. Cl. E04g *7/20*
U.S. Cl. 403—171 **6 Claims**



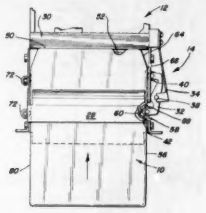
1. Construction elements of underwater trusses comprising a web member having elastic head members secured to each of the opposite ends thereof, spherical hollow opposing joint members having a plurality of holes formed therein, a cup-shaped member covering a portion of each elastic head member and received in one of said holes in each joint member, a tension member extending through said web member and having ends extending through said holes into the hollow portions of said joint members, and stopper means for locking each end of the tension member to said hollow portion of each joint member to interconnect said web member and said joint member in fixed position.

3,864,050

HOLDING MECHANISM FOR TAPE CARTRIDGE

Michael D. Thomas, 640 Fern Ct., Elmhurst, Ill. 60126

Filed Feb. 28, 1974, Ser. No. 446,594
Int. Cl. F16b *2/16*
U.S. Cl. 403—329 **11 Claims**



1. Mechanism for securing a first mating member in an elongated channel of a second mating member, comprising: means defining a transversely extending notch in one wall of said first mating member, said notch including a forwardly inclined surface and being spaced from one end of said first mating member that is adapted to be received in said channel; a locking bridge having opposite ends; resilient means carried by said second mating member and defining a movable pivotal connection supporting said locking bridge intermediate said opposite ends, said resilient means being positioned to locate at least a portion of said locking bridge in said channel and longitudinally aligned with said notch when said first mating member is aligned with said channel, said locking bridge being simultaneously pivoted on said second mating member and moved transversely of said channel when said first mating member is moved into said channel, said notch being positioned to receive one end of said locking bridge against said forwardly inclined surface when said first mating member is in a fully inserted position in said channel with the opposite end of said locking bridge engaging said one wall at a location spaced from said notch to retain said one end in said notch, whereby said one end of said locking bridge applies both a forwardly directed biasing force and a laterally directed biasing force against said forwardly inclined surface while said opposite end of said bridge applies a laterally directed biasing force against said one wall at said spaced location.

3,864,051

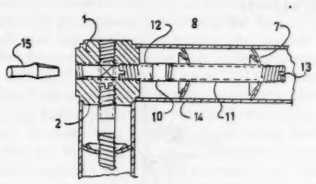
CONNECTING MEANS FOR TUBULAR MEMBERS

Robert Reid, 50 Transwell Ave., Willowdale, Ontario, Canada

Filed Mar. 22, 1973, Ser. No. 343,725
Claims priority, application Canada, May 8, 1972, 141519
Int. Cl. F16b *7/22*
U.S. Cl. 403—408 **4 Claims**

1. A connector for orthogonally connecting together at least two elongate tubular members comprising in combination a hexahedron block having a raised surface on at least two orthogonally oriented faces of said hexahedron block, each raised surface having a circumferential outline corresponding to the inside perimeter of a tubular member to be connected to permit insertion of the raised surface in an end of the tubular member; a threaded stud having a left hand thread at one

end and a right hand thread at the other end, both ends of said stud having means for receiving a driving tool to rotate said stud; a threaded bore extended axially through said hexahedron block and between two diametrically opposed faces of said hexahedron block, there being a threaded bore extending through each of said raised surfaces of said hexahedron block; the number of threaded bores being equal to the number of raised surfaces; a helically threaded washer having a circumferential dimension which permits insertion thereof into a tubular member; said washer having resilient means for permitting insertion of the washer within the tubular member and



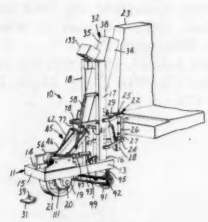
for precluding removal of the washer from the tubular member; said threaded bore having an internal thread for receiving a threaded end of said threaded stud and said washer having an internal thread for receiving the other threaded end of said threaded stud; each end of said threaded stud being threaded into the corresponding internal thread of said threaded bore and said washer to connect said block to the tubular member upon positive rotational advancement of the threaded stud in said washer where the longitudinal axis of said threaded stud is substantially parallel to the longitudinal axis of the tubular member being connected; said threaded stud extending less than halfway into the respective threaded bore.

3,864,052

APPLICATOR FOR PAVEMENT MARKERS

James K. Blomberg, Richfield, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Feb. 4, 1974, Ser. No. 439,090
Int. Cl. E01c *23/16*
U.S. Cl. 404—94 **15 Claims**



1. An applicator for applying pavement markers to a paved surface, comprising:

A. a frame;

B. wheel means supporting the frame and adapted for rolling engagement with the paved surface;

C. a magazine supported by the frame and adapted to receive and hold a stack of pavement markers with an end pavement marker in the stack positioned at an opening in the magazine;

D. picker means mounted on the frame and comprising a movable support means and a gripping means attached to the movable support means, said picker means being adapted to move through a cycle of movement that includes,

1. gripping of said end pavement marker by the gripping means,
2. movement of the support means to carry the gripping means and the end pavement marker from the opening in the magazine to a point adjacent the wheel means so as to present the pavement marker into wedging contact between the wheel means and the paved surface, whereupon the pavement marker is pressed against the paved surface by the wheel means and pulled from the gripping means; and
3. return movement of the support means and gripping means to the point of origin of the cycle of movement; and

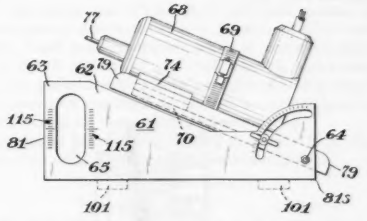
E. drive means for moving the picker means through a cycle of movement.

3,864,053

PORTABLE GUIDE JIG FOR HAND DRILL

William James Harwood, Apt. 6, 4973 Fontaine, Saginaw, Mich. 48603

Continuation-in-part of Ser. No. 328,561, Feb. 1, 1973, Pat. No. 3,809,489. This application July 19, 1973, Ser. No. 380,913
Int. Cl. B23b *49/00*
U.S. Cl. 408—110 **12 Claims**



1. A portable jig adapted to be hand held and to hold and support a portable electric drill at an adjustable predetermined angle relative to a surface to be penetrated by the bit of said drill, which comprises:

i. first and second substantially rectangular troughshaped main support members each having opposed sidewalls connected by a floor, and each having open ends;

ii. the second support member being nested in the first support member and pivotally supported thereby by first and second fastening members, said fastening members each being adjacent and apart from a common end of the jig;

iii. and the floor of the first support member being foreshortened at the end of the jig adjacent the fastening members;

iv. means for locking the first and second support members in predetermined pivotal angle relationship;

v. and on the floor of said second support member, means for mounting the portable electric drill within and to the second support member, said means for mounting being slideable longitudinally of said floor whereby the drill is advanceable towards an end of the jig so as to allow the said bit to be operatively extended; wherein

vi. the sidewalls of each of the first and second support members are substantially parallel and aligned;

vii. the second support member nesting closely inside the first member and being pivotally supported thereby by means of said first and second fastening members each extending through one sidewall of each support member adjacent a common end of the jig but above the floor of the second support member;

viii. and the fastening members each having an axis of rotation and said axis being substantially co-aligned;

ix. the floor of the first support member being foreshortened, extending only from the vicinity of the fastening members toward the end of the first support member remote therefrom; thereby

x. permitting the floor of the second support member to be pivotal through an angle of at least about 45° with respect to the floor of the first support member; wherein

xi. the ends of the sidewalls of the first support member remote from the fastening members are each provided with mutually coplanar and outwardly extending flange portions adapted to be placed on the surface to be penetrated by said bit and to act as a support base for the jig when in use; and wherein

xii. the sidewalls of the first support member are each provided with an extended portion at an end thereof; and

xiii. a hand receiving slot is provided in each extended portion.

3,864,054

TOOL CARRIER

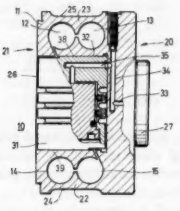
Dieter Eysel, Frankfurt, Germany, assignor to Samson Apparatebau AG, Frankfurt am Main, Germany

Filed June 11, 1973, Ser. No. 368,931

Claims priority, application Germany, June 12, 1972, 2228553

Int. Cl. B23b *29/34*

U.S. Cl. 408—147 **6 Claims**



1. In a tool carrier for rotating or stationary tools having a tool receiving surface adapted to receive a tool thereon resiliently movable with respect to a base plate for small amounts perpendicular to the tool carrier axis, the improvement comprising means defining a cylindrical housing having generally a U-shaped cross section in axial direction, said housing including means defining two pairs of side-by-side and parallel holes therethrough, each pair being located on opposite sides of said cylindrical housing and which are parallel to a theoretical tangent to the exterior cylindrical surface of said housing means, each of said side-by-side holes in each of said pairs being connected by means defining a slot which extends coextensive with said holes and parallel to said theoretical tangent, each of said holes positioned nearest said base plate being connected to a hole of the other pair which is nearest said tool receiving surface by means defining circumferentially extending and externally opening slots which communicate with the interior of said U-shaped housing so that the end of said housing means having said tool receiving surface thereon is resiliently supported relative to said base plate through web means defined by a portion of said housing means which connects said tool receiving surface with said base plate and means for adjustably moving said tool receiving surface relative to said base plate in a direction perpendicular to said tool carrier axis.

3,864,055

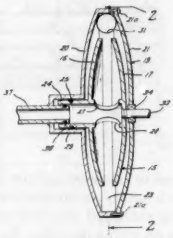
PUMPS CAPABLE OF USE AS HEART PUMPS AND BLOOD PUMPS

Harold D. Kletschka, 1925 Noble Dr., Minneapolis, Minn. 55422, and Edson H. Rafferty, Rt. 1, Box 479, Excelsior, Minn. 55331

Continuation-in-part of Ser. No. 204,980, Dec. 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 886,137, Dec. 18, 1969, Pat. No. 3,647,324, which is a continuation-in-part of Ser. No. 678,265, Oct. 26, 1967, Pat. No. 3,487,784. This application Nov. 9, 1973, Ser. No. 414,225

Int. Cl. F04d *7/00, 29/26*

U.S. Cl. 415—1 **12 Claims**



1. A method of pumping blood which is subject to damage under impact and shear, said method comprising rotating an impeller having a pair of axially spaced smooth discs that define a constant annular cross sectional vaneless pumping chamber therebetween, providing one disc with a central opening communicating with the inner portion of said annular pumping chamber, subjecting the blood to centrifugal action by engagement with the smooth walls of the rotating discs that define the pumping chamber, increasing the outward movement of blood under laminar flow conditions without appreciable turbulance to the outer peripheries of the discs and collecting the discharged laminar flow of said blood from said pumping chamber in an annular unobstructed chamber about said discs without subjecting the blood to impact and/or shear.

3,864,056

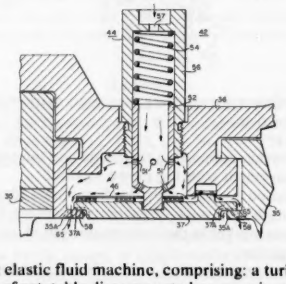
COOLED TURBINE BLADE RING ASSEMBLY

Frank K. Gabriel, Springfield, Pa., and Stephen D. Leshnoff, Highland Park, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 27, 1973, Ser. No. 383,426

Int. Cl. F01d *25/08, 25/14, 25/12*

U.S. Cl. 415—178 **3 Claims**



1. A hot elastic fluid machine, comprising: a turbine casing, a plurality of rotatable discs mounted on an axis, a plurality of rotor blades disposed on the periphery of each of said rotatable discs, a plurality of radially directed stationary blades disposed in annular arrays alternating with said rotatable

discs, each annular array of stationary blades having an inner and an outer shroud ring, a blade ring circumferentially disposed about the blades, means for supplying said stationary blades with cooling fluid, a plurality of insulated ring segments coaxial with said blade ring disposed radially outwardly of said rotating blades and inwardly of said blade ring, conduit means for supplying pressurized cooling fluid to said ring segments, said ring segments disposed about said rotating blades being expansible in both the radial and the axial direction, said radial direction of expansion of said ring segments being controlled by a biasing means, and a heat shield, said heat shield being disposed in a spaced relationship and radially outwardly of, yet fixedly attached to, said ring segments, said heat shield being cooled by chambers having a passageway extending therethrough, said passageway permitting the flow of cooling fluid through said bias producing means, the radially innermost chamber having holes therein, said holes permitting the pressurized cooling fluid to impinge upon said heat shield, the flow of cooling fluid upon said heat shield preventing localized overcooling and hence preventing localized distortion of said ring segments thereby, said heat shield receiving heat from said ring segments by radiation and convection to permit a uniform temperature across said ring segments and, said heat shield providing a heat barrier between said blade ring and said ring segments.

3,864,057

CENTRIFUGAL PUMP

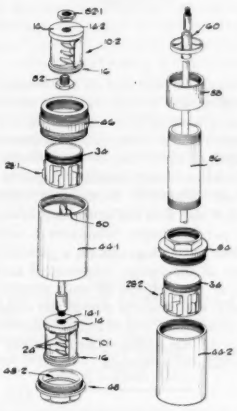
Helgard Holtzhauzen Theron, Rooiwal, District Richmond, Cape Province, South Africa

Filed Aug. 6, 1973, Ser. No. 386,029

Claims priority, application South Africa, Sept. 13, 1972, 72/726250; Oct. 13, 1972, 72/727314

Int. Cl. F04d *13/14, 29/28, 29/44*

U.S. Cl. 415—199 **8 Claims**



1. A centrifugal pump comprising a housing having a discharge opening, an impeller in the housing, the impeller being of a tubular form having an axial inlet opening isolated from the interior of the housing and adapted to discharge into the interior of the housing, and a guide means for guiding fluid in the interior of the housing to the discharge opening, the guide means being arranged axially with respect to the impeller and comprising a tubular member having substantially the same diameter as the impeller with an axial outlet opening and being adapted to guide fluid inwardly into the interior of the guide means, the impeller and guide means, each further comprising a hollow cylindrical member having at least one elongated opening in its peripheral surface, each said opening having two of its defining edges substantially, axially aligned, and each said opening having a vane attached to at least one of said defining edges, each said vane being jointed to a corresponding defining edge in such a manner that each said vane and said peripheral surface cooperate to form an angle therebetween.

3,864,058

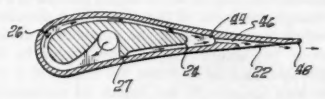
COOLED AERODYNAMIC DEVICE

William C. Womack, Scottsdale, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Feb. 5, 1973, Ser. No. 329,506

Int. Cl. F01d *5/18*

U.S. Cl. 416—97 **11 Claims**



1. A fluid cooled aerodynamic device comprising:

a fluid impervious shell member of aerodynamic shape having leading and trailing edges and having a cavity therein extending along its entire span with an exit opening cummunicating between said cavity and the ambient atmosphere;

a body member inserted in the cavity of said shell member said body being spaced apart from said shell member at predetermined points to form a plurality of chordwise cooling fluid passages therebetween in communication with the exit opening of said shell member and having openings communicating between each of said passages and a source of cooling fluid said body member forming closure means for the ends of said cavity; and

metering means for metering cooling fluid flow from said source into each of said cooling fluid passages.

3,864,059

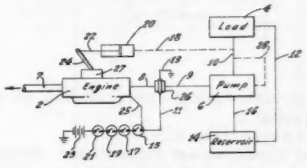
NOISE REDUCTION APPARATUS AND METHOD

Fred T. Smith, Dearborn Heights, Mich., assignor to Sargent Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 274,798, July 24, 1972, Pat. No. 3,812,676. This application Sept. 27, 1973, Ser. No. 401,184

Int. Cl. F04b *49/00*

U.S. Cl. 417—20 **11 Claims**



1. A throttle control device for varying the quantity of fuel fed to an engine in a vehicle at each instant in response to variations in the pressure and volume of a hydraulic fluid discharged from a pump means driven by the engine to maintain the engine at speeds approaching idling, comprising:

auxiliary means for providing a cyclic operation distinct from the movement of the vehicle where the auxiliary means imposes variable magnitudes of load at different times in each cycle,

the auxiliary means being operatively coupled to the pump means to provide for the discharge of the hydraulic fluid from the pump means at each instant in accordance with the magnitude of the variable load from the auxiliary means at that instant;

first receiving means for receiving at each instant characteristics proportional the volume of hydraulic fluid discharged by the pump means to the auxiliary means at that instant;

second receiving means for receiving at each instant characteristics proportional to the pressure of hydraulic fluid discharged by the pump means to the auxiliary means at that instant; and

biasing means,

control means actuatable, against the action of the biasing means, by the cumulative effect of the first and second receiving means at each instant in accordance with the pressure and the volume of the hydraulic fluid respectively introduced to the first and second receiving means to transmit movement to the engine throttle in a direction to change the speed of the engine in a direction corresponding to variations in the cumulative effect of the pressure and flow of the fluid discharged by the pump means and thereby maintain the engine at a speed approaching idling with the degree of movement of the engine throttle being dependent on the cumulative effect of both the pressure and volume of fluid discharged by the pump means, whereby

the torque output of the engine is varied at the engine speeds approaching idling in response to the load requirements imposed upon the pump by the auxiliary means.

3,864,060

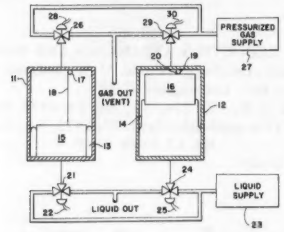
AUTOMATIC LIQUID INVENTORY COLLECTING AND DISPENSING UNIT

John B. Hall, Jr., Newport News, and Edwin F. Williams, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 21, 1973, Ser. No. 334,349

Int. Cl. F04b *49/00, 43/04;* **F04f** *1/06*

U.S. Cl. 417—36 **2 Claims**



1. An automatic liquid inventory collecting and dispensing unit comprising:

first and second tanks;

first and second two-way solenoid valves associated with each of said tanks with the first coupled to a liquid source and its associated tank for allowing the liquid to flow into the tank when the first valve is in its normal position and for allowing the liquid to flow out of the tank when the first valve is in its actuated position and with the second valve connected to its associated tank and a pressurized gas supply for allowing gas inside the tank to flow out when the valve is in its normal position and for allowing gas to flow from the gas supply into the tank when the valve is in its actuated position;

control circuit means for actuating the two valves associated with said first tank and not actuating the two valves associated with the said second tank when both said first tank is filled with liquid and said second tank is emptied for not actuating the two valves associated with said first tank and for actuating the two valves associated with said second tank when both said first tank is emptied and said second tank is filled with liquid whereby said first and second tanks are alternately filled and emptied;

said control circuit means including a piston inside each of said first and second tanks to form a compartment inside each tank for the liquid and a compartment inside the tank for the gas and including a potentiometer associated with each of said tanks and means attached to each said potentiometer and the associated piston for varying the potentiometer in accordance with the movement of said piston.

3,864,061

ARRANGEMENT OF AN ELECTROMAGNETIC PUMP IMMERSED IN A LIQUID MATERIAL PROVIDING A CONSTANT DISCHARGE

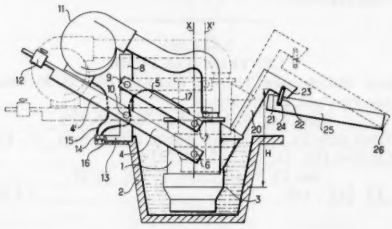
Henri Carbonnel, and Guy Moriaud, both of Paris, France, assignors to Groupement Atomique Alsacienne Atlantique, Le Plessis Robinson, France

Filed Sept. 28, 1973, Ser. No. 401,789

Claims priority, application France, Sept. 28, 1972, 72.34393

Int. Cl. H02k *45/00*

U.S. Cl. 417—50 **4 Claims**



1. In an arrangement wherein an electromagnetic cylindrical pump is immersed in a ladle of liquid metal and provides a discharge independent of the variations in the level of liquid metal, the improvement comprising: adjustable means for keeping the depth of immersion of the cylindrical pump constant and for simultaneously keeping the pump axis in a vertical position, said adjustable means comprising two sets of connecting rods **4** and **5** of the same length, each set forming an articulated parallelogram, trunnions **6** and **7** fixing two apices of the two parallelograms on a generating line of the cylindrical body of the pump, trunnions **9** and **10** fixing the other two apices respectively of said parallelogram to the liquid metal ladle and wherein one of the connecting rods of each set being extended towards the outside of the ladle by an arm **4'** bearing an adjustable counterweight to enable the depth of immersion to be varied.

3,864,062

SYSTEM FOR STORING A FLOWABLE MASS

Jean-Pierre LeFur, Vienne, France, assignor to Enterprise de Recherches et d'Activites Petrolieres, Paris, France

Filed Apr. 17, 1973, Ser. No. 352,080

Claims priority, application France, Apr. 18, 1972, 72.14371

Int. Cl. F04f *1/06, 3/00*

U.S. Cl. 417—121 **5 Claims**

1. A system for the storage of a flowable mass capable of displacement by a high-pressure driving fluid, comprising:

a plurality of storage units for said flowable mass each including a closed vessel with a first conduit and a second conduit;

a supply conduit for said flowable mass common to said units;

a source of driving fluid provided with a high-pressure conduit for each of said units;

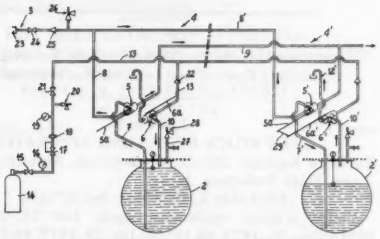
a discharge conduit for said flowable mass at each of said units;

a venting conduit for said fluid at each of said units;

first three-way valve means at each of said units for connecting said first conduit thereof to said supply conduit in a filling position and to said discharge conduit in an emptying position;

second three-way valve means at each of said units for connecting said second conduit thereof to said venting conduit in a filling position and to said high-pressure conduit in an emptying position;

first actuating means for each of said units for alternately placing said first valve means thereof in said filling and emptying positions; and



second actuating means for each of said units for alternately placing said second valve means thereof in said filling and emptying positions;

joint placement of said first and second actuating means in said filling positions establishing a circuit from said supply conduit through the vessel to said venting conduit, joint placement of said first and second actuating means in said emptying position establishing a circuit from said source through the vessel to said discharge conduit, simultaneous placement of said first actuating means of one unit in said filling position and of said second actuating means of the same unit in said emptying position establishing a circuit from said source through the vessel of said one unit to said supply conduit whereby the contents of said vessel can be transferred to the vessel of another unit having said first and second actuating means in said filling position.

3,864,063

AUTOMATIC TORQUE LIMITATION CONTROL

Robert J. Martin, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Sept. 11, 1973, Ser. No. 396,317
Int. Cl. F04b *1/26*
U.S. Cl. 417—222 **2 Claims**

1. A torque-compensating control system for a variable displacement pump with an outlet port, the pump having a tiltable swash plate actuated by a fluid operated displacement cylinder normally biased toward its maximum flow position, the system comprising:

a pilot-operated valve means positioned in fluid communication with the displacement cylinder, pump outlet port, and drain, having a first position directing fluid pressure to the displacement cylinder and a second position draining the displacement cylinder to tank;

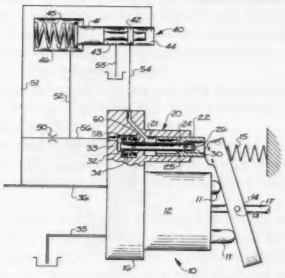
a first pilot servo urging the valve means towards its first position;

a first sensing line connecting the first pilot servo to the pump outlet pressure;

a second pilot servo urging the valve means toward the second position with the assistance of a biasing means;

a second sensing line connecting the second pilot servo across an orifice to the pump outlet pressure; and

variable relief valve means relieving the pressure in the second pilot servo, the relief valve means including a hollow pressurized plunger reacting against a spring means with its interior connected to the second pilot servo, the plunger having a first valve opening therein, the plunger passing axially through the displacement piston



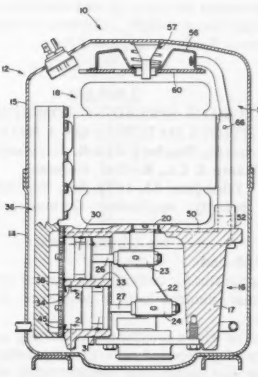
with the displacement piston acting as a valving means on the first valve opening, the spring force on the plunger increasing as the plunger follows the piston toward a minimum flow position causing the relieving pressure level to increase as the pump swash plate decreases its displacement whereby the torque output of the pump remains substantially constant at various pump discharge pressure levels.

3,864,064

SUCTION MUFFLER TUBE FOR COMPRESSOR

Edwin L. Gannaway, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 12, 1973, Ser. No. 340,553
Int. Cl. F04b *21/00;* **F01n** *3/06*
U.S. Cl. 417—312 **4 Claims**



1. A gas compressor, comprising:

a housing means,

a compressor in said housing means having intake valving, an intake manifold leading to said intake valving,

intake muffler means opening into said housing means,

an intake muffler tube leading from said muffler means to said intake manifold, and

a by-pass tube leading to said intake manifold and opening into said housing means without passing into the muffler

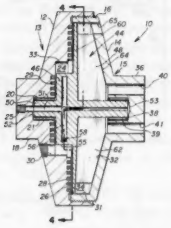
means, said by-pass tube being concentric with said intake tube and surrounding the same.

3,864,065

REFRIGERANT EXPANDER COMPRESSOR

Fred L. Goldsberry, Amarillo, Tex., assignor to Lone Star Gas Company, Dallas, Tex.

Filed Dec. 7, 1973, Ser. No. 422,759
Int. Cl. F04b *17/00*
U.S. Cl. 417—406 **12 Claims**



1. A rotary device comprising:
a housing having first and second chambers, each chamber having a discharge passageway;
an axially extending shaft mounted in said housing and extending into the first and second chambers, said shaft having a fluid inlet passageway formed therein;
bearing means supporting the shaft for rotation relative to the housing;
means sealing said first chamber from said second chamber;
a rotor fixedly mounted on said shaft for rotation therewith in said first chamber, said rotor including a fluid passageway communicating between the inlet passageway of the shaft and nozzle means adapted to effect fluid discharge generally tangentially into said first chamber to impart rotation to said rotor by reaction to the fluid discharge from the nozzle means; and
impeller means mounted on said shaft in said second chamber and driven thereby, said impeller means adapted to compress fluids introduced thereto.

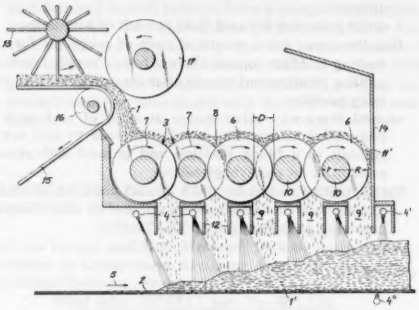
3,864,066

APPARATUS FOR SPREADING COMMINUTED PARTLY CEMENTITIOUS MATERIAL ON A MOVING SUPPORT

Klaus Gerhardt, Penzberg-Reindl, Germany, assignor to G. Siempelkamp & Co., Krefeld, Germany

Filed June 13, 1973, Ser. No. 369,734
Claims priority, application Germany, June 15, 1972, 2229147
Int. Cl. B28b *5/00*
U.S. Cl. 425—84 **6 Claims**

1. An apparatus for converting a mass of comminuted partly cementitious material into a moistened continuous layer, comprising:
a conveyor with a horizontal supporting surface;
an array of juxtaposed rollers with parallel horizontal axes above said supporting surface, each roller including a cylindrical hub and a multiplicity of axially spaced annular fins on said hub, the fins of adjacent rollers being interdigitated with formation of narrow slots in the gaps between the hubs thereof;
drive means for codirectionally rotating said rollers and simultaneously moving said conveyor;
feed means for continuously depositing comminuted cementitious material on said rollers for distribution into a plurality of flows descending in a free fall through said gaps to said supporting surface;
flow-guiding means underneath said rollers for confining the descending material to the vicinity of said gaps; and



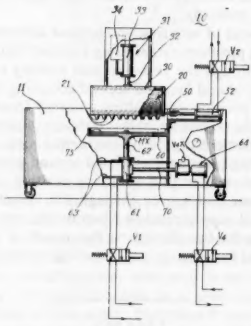
spray means underneath said rollers for irrigating the descending flows of said cementitious material.

3,864,067

CAKE STOCK DISPENSING APPARATUS

Tadahiro Kajitani, 288-28, Oaza-Anyoji, Ritto-cho, Kurita-gun, Shiga Prefecture, Japan

Filed May 4, 1973, Ser. No. 357,196
Claims priority, application Japan, Jan. 24, 1973, 48-10513; Jan. 24, 1973, 48-10514; Jan. 25, 1973, 48-11529[U]
Int. Cl. A21c *5/02*
U.S. Cl. 425—166 **3 Claims**



1. In a cake stock dispensing apparatus including:
a. a cake stock container having a bottom plate provided with a number of nozzle openings and an intermediate plate provided with a number of openings therethrough aligned with the nozzle openings;
b. a shutter disposed slidably between the bottom plate and the intermediate plate for opening and closing the openings of the plates,
c. a depressing plate positioned above the shutter for downwardly depressing cake stock contained in the container,
d. a supporting plate positioned below the nozzles of the bottom plate for removably supporting a disk which is adapted to receive the cake extruded through the nozzles,
e. a first cylinder operatively connected to the shutter for moving the shutter, and
f. a second cylinder operatively connected to the supporting plate for raising and lowering the supporting plate; the improvement comprising:
g. a depressing means for operating the depressing plate including an operating cylinder and an auxiliary cylinder, a first piston reciprocably mounted in the operating cylinder and a piston rod operatively connecting the first

piston to the depressing plate, the first piston dividing the operating cylinder into a lower chamber below the first piston and an upper chamber above the first piston, a second piston reciprocably mounted in the auxiliary cylinder and dividing the auxiliary cylinder into a lower chamber below the second piston and an upper chamber above the second piston, pipe means connecting the lower chambers of the operating cylinder and the auxiliary cylinder, at least one magnetic valve interposed in said pipe means, the lower chambers being filled with incompressible fluid, and magnetic valve means for filling the upper chambers with compressed air,

h. sliding means operatively connected to the second cylinder for horizontally sliding the supporting plate, and

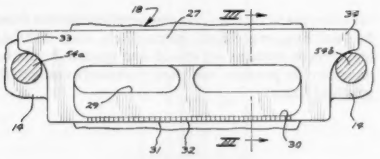
i. electrical control circuit for controlling the first and seond cylinders, the depressing mechanisms and the sliding means in properly timed relation.

3,864,068

HOT MELT EXTRUSION APPARATUS

John R. Flakne, Minneapolis, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Feb. 9, 1973, Ser. No. 330,935
Int. Cl. B29f *3/04*
U.S. Cl. 425—192 **7 Claims**



1. A filament extrusion apparatus including means for supplying extrusion material at extrusion pressure;

means for heating said extrusion material to a plastic condition; and

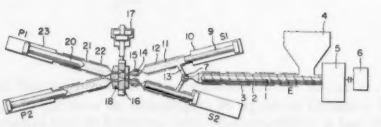
die means, said die means including a plurality of identical die plates, each of said die plates including a pair of laterally extending shoulder means, said apparatus including a pair of rod means on which said shoulder means may rest for support, each of said die plates having first and second machined surfaces, a flow channel defined through each of said die plates, a ridge along one edge of each die plate, said ridge having defined therein a plurality of orifices and a flow passageway interconnecting said flow channel and said orifices.

3,864,069

APPARATUS FOR CROSS-LINKING MOLDING OF HIGH POLYMERS

Mamoru Takiura, Kawasaki; Yasushi Ebisawa, and Noriyuki Kikuchi, both of Tokyo, all of Japan, assignors to Ikegai Tekko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1973, Ser. No. 347,203
Claims priority, application Japan, Apr. 4, 1972, 47-33660
Int. Cl. B29f *3/02*
U.S. Cl. 425—204 **7 Claims**



1. A high-pressure fluid cross-linking molding apparatus for use in molding high polymers, comprising:

extruder means for melting and kneading a mixture composed of high polymers and a cross-linking agent by applying such temperature and pressure as will not give rise to a cross-linking reaction;

a plurality of feeding units each having a feed chamber containing a relatively movable feeding plunger therein and a heating device for imparting heat energy within said chamber effective to cause a cross-linking reaction;

passageway means providing communication between the discharge end of said extruder means and the feed chambers associated with the plurality of feeding units;

a plurality of reaction units each having a reaction compartment and a relatively movable reaction plunger therein, each of said reaction units being associated with a corresponding one of said feeding units;

a plurality of first passages connecting and providing communication between each of said feed chambers and a corresponding reaction compartment;

a molding head assembly and a plurality of second passages connected to and providing communication between said reaction compartments and said molding head assembly; and

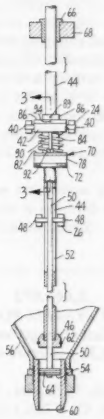
transfer valve means associated with said first and second passages for alternately opening and closing said first and second passages to provide for the continuous flow from said reaction compartments to said molding head assembly while permitting intermittent and alternating flow from each of said feed chambers to a corresponding reaction compartment.

3,864,070

ADJUSTABLE DOUGHNUT MACHINE

Leland W. Pendleton, 1343 Folsom Ave., San Pablo, Calif. 94806

Filed Sept. 15, 1972, Ser. No. 289,421
Int. Cl. A22c *11/18*
U.S. Cl. 425—287 **2 Claims**



1. In a doughnut dispensing machine having a dough hopper with a discharge throat, an upper plunger and a lower plunger arranged on a common axis and operable in said throat in a predetermined coordinated cycle to dispense doughnuts from the discharge throat, a first vertical member connected to said upper plunger and a second vertical member connected to said lower plunger, and actuating means operably connected to each of said connecting members for cycling each of said plungers; the improvement comprising an adjustment mechanism for varying the discharge of doughnuts which comprises: a bushing threadably connected to said first vertical member

and arranged for adjustable vertical displacement relative thereto,

an annular sleeve so constructed and arranged on said bushing that vertical displacement relative to said bushing is prevented and rotational movement relative to said bushing is permitted,

a collar arranged above said bushing and slidable on said first vertical member,

a compression spring arranged between said collar and said bushing,

an annular cap arranged above said collar and connected to said annular sleeve with elongated connecting pins and so constructed and arranged that said collar is restricted in vertical movement except by compression of said spring, and,

means operably connecting said collar to the actuating mechanism.

3,864,071

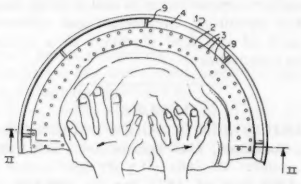
PIZZA PIE MAKING APPARATUS AND METHOD

Luigi La Monica, 1533 85th St., Brooklyn, N.Y. 11228

Filed Apr. 3, 1973, Ser. No. 347,476

Int. Cl. A21c *11/12*

U.S. Cl. 425—470 **19 Claims**



1. A pie crust making and retaining device comprising:

a generally flat surface for receiving pie dough thereon;

means for piercingly engaging and preventing shrinkage of said pie dough, said engaging and shrinkage preventing means including a plurality of spaced projections extending from said flat surface and being distributed over a substantial portion of said flat surface, said projections extending from said flat surface by an amount which is less than the thickness of the pie crust to be made from said dough and maintaining said dough in its formed condition; and

forming means at the outermost portion of said pie crust making device for forming a raised edge of the dough relative to the flat surface at least around the periphery of said flat surface.

3,864,072

COMBUSTION SYSTEM FOR FLARE GAS

Randolph Abernathy, East Orange, and Thomas L. Shepherd, Essex Fells, both of N.J., assignors to Airco, Inc., Montvale, N.J.

Filed Oct. 10, 1973, Ser. No. 405,204

Int. Cl. F23d *13/20*

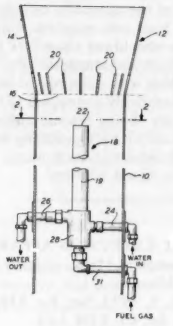
U.S. Cl. 431—5 **11 Claims**

1. A stack combustion tip for burning flare gas comprising:

a. an enclosure at the top of the stack forming an open-end combustion chamber for receiving flare gas rising through the stack,

b. the combustion chamber having an enlarged cross-section with respect to the cross-section of the stack and having at its lower periphery openings to ambient air,

c. and an oxygen-fuel burner mounted substantially centrally within the stack for projecting hot, turbulent elongated oxygen-fuel flames into the combustion chamber, said burner having a barrel portion defining an elongated burner chamber substantially centrally positioned within said stack and parallel to the longitudinal axis of said stack, a plurality of fuel passages for supplying streams of fuel, a plurality of oxygen passages for supplying streams of substantially pure oxygen, and means for cooling said burner chamber which chamber is positioned to receive



said streams of fuel and oxygen supplied thereto from said fuel and oxygen passages, respectively, such that said fuel and oxygen streams are mixed and ignited in said burner chamber to produce said hot, turbulent elongated oxygen-fuel flame.

3,864,073

METHOD FOR COMBUSTION FUELS WHICH ARE EJECTED FROM AN ORIFICE IN A MANNER TO FORM A SUBSTANTIALLY CONICALLY SHAPED CURTAIN OF FUEL AND A DEVICE FOR PUTTING THE METHOD INTO EFFECT

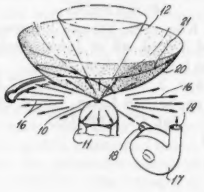
Martti Ilmari Kolhi, Stenhamra, Sweden, assignor to R. Collin Consulting AB, Stockholm, Sweden

Division of Ser. No. 127,228, March 23, 1971, Pat. No. 3,758,258. This application June 26, 1973, Ser. No. 373,866

Claims priority, application Sweden, Mar. 24, 1970, 4010/70

Int. Cl. F23l *1/00*

U.S. Cl. 431—115 **23 Claims**



1. A device for combusting fuel with a conical fuel curtain and a conical envelope of combustion air external of the fuel cone and a subatmospheric zone external of said conical fuel curtain, said device having a combustion zone, comprising:

a fuel nozzle having a fuel orifice to provide a substantially conical fuel curtain; and

at least one air exit means, located around the axis of the fuel cone, for establishing said subatmospheric zone externally of said conical fuel curtain to hold said combustion zone rearwardly withdrawn toward said nozzle and concentrated around said axis of the fuel cone in which said means is an annular gap communicating with a source of subpressure.

3,864,074

YARN HEATER

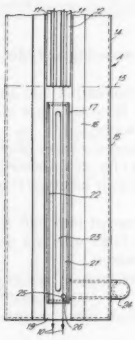
Samuel Gosling, Bollington nr. Macclesfield, England, assignor to Scrogg Ernest and Sons Limited, Macclesfield, England

Filed Jan. 28, 1974, Ser. No. 437,354

Claims priority, application Great Britain, Jan. 27, 1973, 73-04303

Int. Cl. F27b *9/28*

U.S. Cl. 432—59 **7 Claims**



1. In a yarn heater assembly comprising means defining an elongate heating zone for at least one running yarn, the improvement comprising an endwise longitudinally projecting extension at one end at least of said assembly, and fume removal means incorporated in said extension.

3,864,075

APPARATUS FOR BURNING GRANULAR OR PULVEROUS MATERIAL

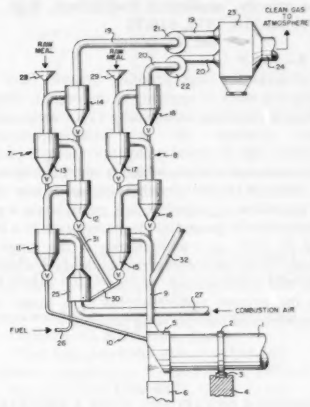
Soren Bent Christiansen, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Apr. 29, 1974, Ser. No. 464,964

Claims priority, application Great Britain, Apr. 30, 1973, 20463/73

Int. Cl. F27b *7/02*

U.S. Cl. 432—106 **19 Claims**



1. A plant for burning granular or pulverous material comprising a preheater having at least two cooperating units, each unit having an inlet and an outlet for heating gas or air and a raw material inlet, a kiln having means for feeding preheated raw material from said preheater, cooling means associated with said kiln for cooling material burnt therein, means for dividing said heated cooling air such that a portion is directed as combustion air to said kiln and a portion is directed to an inlet of at least one preheater unit, means for connecting the gas inlet of said other preheater unit to an exhaust gas outlet of said kiln, and means associated with each preheater unit at or near its gas or air outlet for controlling the air or gas flow through each associated unit and the division of the heated cooling air.

CHEMICAL

3,864,076
PROCESS FOR FLAMEPROOFING ORGANIC FIBERS WITH PHOSPHORUS-CONTAINING CONDENSATION PRODUCTS AND THE PRODUCTS PRODUCED

Hermann Nachbur, Dornach, and Arthur Maeder, Therwil, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Aug. 31, 1972, Ser. No. 285,173

Claims priority, application Switzerland, Sept. 10, 1971, 13307/71; Jan. 14, 1972, 516/72

Int. Cl. D06m *1/00*

U.S. Cl. 8—116 P **14 Claims**

1. A process for flameproofing organic fiber materials, comprising the steps of applying to the organic fiber material an aqueous preparation comprising (1) a water-soluble condensation product of a tetrakis-(hydroxymethyl)-phosphonium salt or tetrakis-(hydroxymethyl)-phosphonium hydroxide and a guanidine, which is obtained by condensing (a) the tetrakis-(hydroxymethyl)-phosphonium compound with (b) guanidine, a guanidine salt, guanylurea, a guanylurea salt, a methylolated guanidine or guanylurea, in a molar ratio of 1:0.02 to 1:0.5, at a temperature in the range of 40° to 120°C, and (2) an aminoplast precondensate which is different from the condensation product (1), and subsequently finishing the organic fiber material by a moist batch, wet batch, ammonia or thermofixing process.

3,864,077
NON-AQUEOUS DYESTUFFS WITH A PHTHALIC ACID DIALKYL ESTER

Gottfried Popp, Cologne; Wolfgang Haebler, Odentha L-Neschen, and Wilhelm Gohrbandt, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 1, 1972, Ser. No. 285,579

Claims priority, application Germany, Sept. 2, 1971, 2143993

Int. Cl. D06p *5/04*

U.S. Cl. 8—173 **7 Claims**

1. A storage-stable non-aqueous dyestuff dispersion consisting essentially of

a. a phthalic acid C_1–C_8-dialkyl ester;

b. a water-soluble or water-dispersible dyestuff which is insoluble or sparingly soluble in phthalic acid C_1–C_8-dialkyl ester; and

c. an anionic dispersing agent, a non-ionic dispersing agent, or a mixture of anionic and non-ionic dispersing agent having a minimum solubility of 1 g per litre of tetrachloroethylene;

said composition containig 10 to 40% of dyestuff, which dispersion is obtained by grinding or kneading said components (a), (b) and (c) together.

3,864,078
INHIBITING COLOR CHANGE IN SOLUTIONS OF VINYLAROMATIC RESINS IN CHLORINATED SOLVENTS

William E. Gealy, Forward Township, Allegheny County, and Walter A. Vrendenburgh, Pleasant Hills, both of Pa., assignors to Hercules Incorporated, Wilmington, Del.

Filed Nov. 17, 1972, Ser. No. 307,656

Int. Cl. D061 *1/04*; **C07c** *17/40*

U.S. Cl. 8—142 **8 Claims**

1. The method of inhibiting color deterioration in dry cleaning and sizing solutions comprising a vinylaromatic resin in a chlorinated solvent which method comprises treating the solution by contacting the solution with lime, allowing sufficient time and stirring to effect color stabilization, and thereafter filtering the lime from the solution.

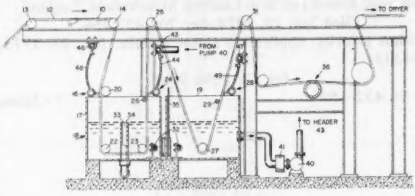
3,864,079
METHOD FOR SCOURING AND BLOOMING PILE CARPET

Rodman I. Gregg, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 149,963, June 4, 1971, Pat. No. 3,747,375. This application Mar. 19, 1973, Ser. No. 342,918

Int. Cl. B05c *3/152*

U.S. Cl. 8—151 **4 Claims**



1. A method of scouring and blooming a pile carpet comprising:

advancing a wetted carpet into and through a first tank at least partially filled with hot water and immersing said carpet in the water;

directing high pressure spray of hot water at a pressure of at least 100 p.s.i.g. at a downward angle at the pile side of said carpet as it emerges from the water in said first tank;

advancing said carpet into and through a second tank at least partially filled with hot water and immersing said carpet in the water;

directing a rinsing spray at said pile side of said carpet as it emerges from the water in said second tank; and

supplying said high pressure spray with water from said second tank.

3,864,080
ROOM ODOR CONTROL

Bruno M. Valbona, Avon, and Harry M. Voglesonger, Riverton, both of Conn., assignors to Dynamics Corporation of America, New York, N.Y.

Continuation-in-part of Ser. No. 264,135, June 19, 1972, Pat. No. 3,829,071. This application July 23, 1973, Ser. No. 381,802

Int. Cl. A61l *9/00*

U.S. Cl. 21—53 **11 Claims**

4. A liquid dispenser for odor control comprising:

a housing having air inlet and outlet openings,

a motor supported in said housing,

a porous resilient disk impeller of expanded plastic disposed between said openings and rotated by the motor, said impeller having a porous rough surface means on at least one of two radially extending sides for inducing movement of air between the inlet and outlet openings,

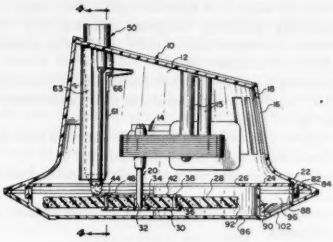
a feeder element means resiliently supported in close proximity to said rough surface means for movement into momentary contact with said rough surface means and having an exposed face remote from said surface means, liquid supply means supported in the housing for supplying to said exposed face of the feeder element means a small amount of odor control liquid, and

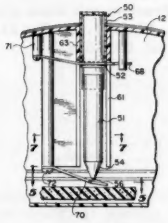
manually movable means actuating said supply means and feeder element means for moving limited amounts of odor control liquid into contact with said rough surface means and for distributing liquid supplied to the feeder element means progressively over a circular path on said rough surface means for absorption by the disk impeller while the disk impeller is being rotated continuously.

11. The method of controlling room odor comprising turbulating and circulating contaminated room air with a rough rotating surface of porous resilient material,

simultaneously contacting and compressing a limited portion of the porous material along a circular path,

applying a flowing drops of odor control liquid onto the path at the point of compression,





releasing the compression to expand the porous material to absorb the control liquid thereon into the pores of the material immediately following each compression at a given point to store a supply of liquid in the pores,

centrifugating the absorbed control liquid to slowly expose it to the air at the rough surface,

vaporizing and entraining liquid from the surface of the porous material through intimate contact with air circulated past the rough surface, and

discharging the turbulated air into a room.

3,864,081

APPARATUS FOR STERILIZING BIOLOGIC MATERIAL AND THE LIKE BY ULTRA-VIOLET IRRADIATION

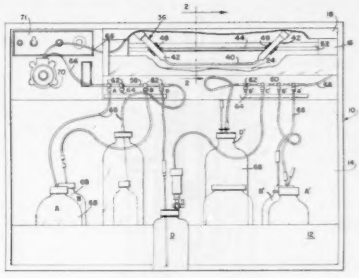
Gerald A. Logrippo, Pleasant Ridge, Mich., assignor to Spectroderm International Inc., Fairfax, Va.

Filed June 12, 1973, Ser. No. 369,250

Int. Cl. A61l *3/00*

U.S. Cl. 21—102 R **8 Claims**

1. Apparatus for sterilizing liquids comprising a casing defining a chamber therein for receiving liquid container means for liquid to be sterilized, means forming a separate compartment within said casing with a liquid sterilizing enclosure therein, the walls of said enclosure being constructed of Quartz, and ultra-violet tube means within said compartment disposed adjacent said enclosure slidably adjustable clamping means within said comparment for detachably securing said enclosure thereto, means in said compartment for securing said ultra-violet tube thereto including adjustable means for varying the distance of said ultra-violet tube from said enclosure to vary the intensity of irradiation with respect to liquid passed therethrough, pump means in said casing, and means operatively connecting container means disposed in said



chamber with said pump means and said enclosure for passing liquid to be sterilized therethrough.

3,864,082

METHOD OF CONTINUOUSLY MEASURING THE PROGRESS OF DEVELOPMENT OF PHOTOGRAPHIC EMULSIONS

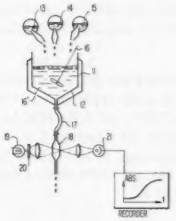
Kato, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Kanagawa, Japan

Filed Feb. 14, 1973, Ser. No. 332,445

Claims priority, application Japan, Feb. 15, 1972, 47-15772

Int. Cl. G03c *5/26, 5/24;* **G01n** *31/06*

U.S. Cl. 23—230 R **8 Claims**



1. A method of continuously measuring the progress of development of a silver halide photographic emulsion which comprises mixing a liquid silner hodide photographic emulsion and a developer, continuously passing the mixture through a flow cell without adding thereto a fixing solution or a stopping solution, irradiating the mixture passing through the flow cell with measurement light having any desired wave length measuring the absorbance of the photographic emulsion, and immediately withdrawing the mixture from the flow cell.

2. The method as set forth in claim 1 wherein said photographic emulsion is exposed to light prior to being introduced into the flow cell.

3,864,083

CARBON DETECTION

Norman W. Green, Lake Hiawatha, and Richard W. Dunning, Piscataway, both of N.J , assignors to Exxon Research and Engineering Company, Linden, N.J.

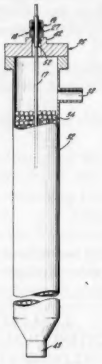
Filed June 26, 1970, Ser. No. 50,108

Int. Cl. C01b *2/14;* **G01r** *27/02;* **G01n** *27/04*

U.S. Cl. 23—230 PC **9 Claims**

1. In processes involving reactions of carbonaceous materials in the presence of a bed of catalyst wherein said catalyst is activated at some point within the bed and wherein coke is formed in the bed of catalyst and the coke formed is detected

by reference to changes in the conductivity of the catalyst bed, the improvement comprising measuring changes in conductivity of said catalyst bed only over an area within the bed sufficient to encompass the point where the catalyst is first activated.

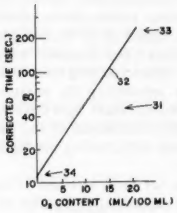


3,864,084

METHOD FOR MEASUREMENT OF OXYGEN CONTENT IN BLOOD AND OTHER LIQUIDS BY OXYGEN INHIBITION OF CHEMICAL REACTIONS

M. Judah Folkman, 18 Chatham Cir., Brookline, Mass. 02146

Filed Aug. 3, 1972, Ser. No. 277,810
Int. Cl. C08f *3/90*; G01n *33/16*
U.S. Cl. 23—230 R **25 Claims**



1. A method of measuring the oxygen content of liwuids comprising the steps of:

mixing a test liquid containing oxygen with an activator liquid to produce a polymer by a free radical initiated polymerization reaction that is inhibited by oxygen in said test liquid;

isolating said test liquid and said activator liquid from any gas phase during said mixing step; and

timing said polymerization reaction to determine the amount of oxygen initially present in said test liquid and consumed during said reaction.

3,864,085

GLUTATHIONE REAGENT AND TEST METHOD

Joseph Eliot Woodbridge, Princeton, N.J., assignor to Princeton Biomedix Incorporated, Princeton, N.J.

Filed Oct. 31, 1973, Ser. No. 411,228
Int. Cl. G01n *33/16*
U.S. Cl. 23—230 B **7 Claims**

1. A method for the quantitative determination of thiol-containing compounds in biological fluids comprising the steps of:

a. mixing an aliquot of said biological fluid with a reagent comprising stabilized tungstic acid, ethanol, and 5,5'-dithiobis (2-nitrobenzoic zcid), to thereby obtain a precipitate and a supernatant;

b. separating said supernatant from said precipitate;

c. measuring the optical density of said supernatant against water at 412 nm;

d. mixing said supernatant with a buffer such that the pH of the mixture is from about 7 to about 10;

e. measuring the optical density of said mixture at 412 nm; and

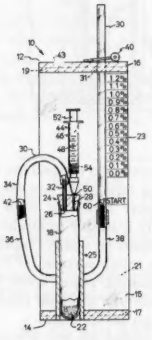
f. determining the concentration of said thiol-containing compounds.

3,864,086

APPARATUS FOR MEASURING GASEOUS QUALITY OF A SUBSTANCE

Kenneth R. Geist, and James E. Walsh, both of Milwaukee, Wis., assignors to Brust, by said Geist, a part interest

Filed Dec. 29, 1971, Ser. No. 213,523
Int. Cl. G01n *7/18*
U.S. Cl. 23—253 R **5 Claims**



1. Apparatus for directly measuring the percentage by weight of acid contained in a liquid sample of predetermined volume comprising: a supporting means, a sealable flask removably mounted in a fixed position on said supporting means and wherein said sample and an agent are to be mixed to effect evolution of a gas, said flask having a mouth through which said agent is deposited prior to sealing of said flask, removable sealing means for insertion into said mouth to seal said flask, said sealing means having a first opening and a second opening, sample supplying means selectively operable to inject said sample into said flask after said flask is sealed, said sample supplying means being closed to prevent gas escape therethrough and being removably insertable into said first opening in said removable sealing means in sealed relationship, said flask having an air space therein which tends to vary in volume depending on the amount of agent deposited in said flask or the extent of insertion of said sealing means in said mouth or both, tube means having one end connected to said second opening in said sealing means and having its other end exposed to atmosphere, said tube means comprising a flexible intermediate portion and a vertically movable upright leg

portion at its said other end, said upright leg portion having a transparent portion, an indicator liquid in said tube means providing a meniscus in said movable upright leg portion which is visible through said transparent portion, scale means mounted in fixed position on said supporting means and including a fixed starting point and fixed graduated indicia directly indicative of percentages by weight of acid possibly contained in a sample, and attachment means for releasably securing said movable upright leg to said supporting means in desired fixed adjustment positions, said movable leg portion being relatively movable vertically with respect to said scale means to initially effect alignment of said meniscus with said starting point after said flask is sealed and prior to exposure of said sample to said agent for adjustment purposes to compensate for variations in volume in the air space in said flask, said indicator liquid being subsequently displaceable in response to generation of gas in said sealed flask so that said meniscus moves into alignment with the said indicia on said scale means to provide a direct indication of the percentage by weight of acid present in said sample.

3,864,087

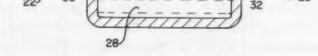
TITRATING SYSTEM

Tomas Hirschfeld, Framingham, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Filed May 14, 1973, Ser. No. 359,845

Int. Cl. G01n *21/08, 21/06*

U.S. Cl. 23—253 R **15 Claims**



1. A chemical measuring system for titrating a sample solution with a titrant capable of reacting with said solution to produce an observable end-point change, and comprising, in combination:

means for containing a body of said titrant;

a hollow, elongated conduit disposed within said means for containing, the wall of said conduit being porous so that a net flow through said wall can occur between said body of titrant and a stream of sample solution flowing through said conduit; and

means for determining the relative position along said conduit at which said end-point change is observable.

3,864,088

APPARATUS FOR DETERMINING THE CONTENT OF ORGANIC SUBSTANCES IN WATER

Heinz Delin, Wedel/Holstein, and Werner Voss, Hamburg, both of Germany, assignors to H. Maihak A.G., Hamburg, Germany

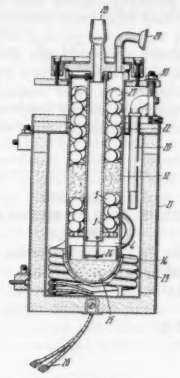
Filed Mar. 5, 1974, Ser. No. 448,380

Claims priority, application Germany, Mar. 6, 1973, 7308398[U]

Int. Cl. G01n *25/00, 33/18*

U.S. Cl. 23—253 PC **8 Claims**

1. In an apparatus for determining the content of organic substances in water, a combination comprising a crucible having an upper end provided with an inlet for drops of water, and a bottom wall; an impact plate adjacent to but upwardly spaced from said bottom wall and so positioned that drops of water drip into said impact plate and become fragmented thereby onto smaller droplets; a layer of non-caking particulate material on said bottom wall beneath said impact plate, so that said droplets fall onto said layer; heating means for heating the region of said impact plate and layer, so that said droplets become vaporized on said layer and organic substances present in them become combusted and form CO_2; and discharging means for discharging the water vapor and



CO_2 to the exterior of said crucible for analysis of the CO_2 contents in a gas analyzer.

3,864,089

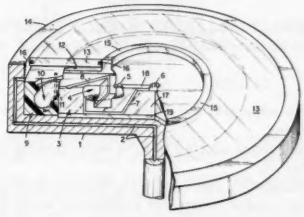
MULTIPLE-SAMPLE ROTOR ASSEMBLY FOR BLOOD FRACTION PREPARATION

Thomas O. Tiffany; James C. Mailen, both of Oak Ridge; Wayne F. Johnson, Loudon; Charles D. Scott, and W. Wilson Pitt, Jr., both of Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Dec. 10, 1973, Ser. No. 423,381

Int. Cl. B04b *9/12, 11/02*

U.S. Cl. 23—258.5 **5 Claims**



1. A multiple-sample centrifugal rotor assembly for blood fraction preparation comprising:

a. an inner disk-shaped rotor portion having a top end surface, said inner rotor portion defining:

i. a multiplicity of radially oriented sample-receiving chambers having centripetal and centrifugal ends, said sample-receiving chambers being disposed in a circular array;

ii. a multiplicity of static sample-loading ports, each of said ports communicating between said top end surface and respective sample-receiving chambers;

iii. a centrally located dynamic distribution port open to said top end surface;

iv. a multiplicity of distribution passageways, each of said distribution passageways communicating between said dynamic distribution port and the centrifugal end of a respective sample-receiving chamber; and

v. a multiplicity of transfer passageways, each of said transfer passageways communicating between one of said sample-receiving chambers at a point intermedite its centrifugal and centripetal ends and the radial pe-

riphery of said inner rotor portion, each of said transfer passageways extending radially inward from its point of communication with said sample-receiving chamber and then generally radially outward to said radial periphery of said inner rotor portion; and

b. a removable outer rotor portion having an annular configuration nested concentrically about said inner rotor portion, said outer rotor portion defining at least one collection chamber in fluid communication with said transfer passageways in said inner rotor portion for receiving material discharaged from said transfer passageways.

3,864,090

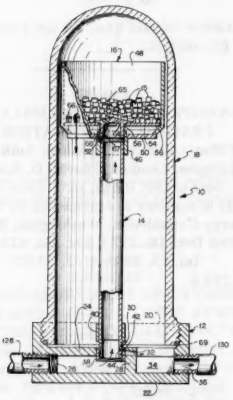
PRESSURE-TYPE TABLET HYPOCHLORINATING DEVICE

Kenneth Richards, P.O. Box 17, Gordon Town, Parish of St. Andrews, Jamaica, British W. Indies

Filed Oct. 12, 1973, Ser. No. 405,769

Int. Cl. B01d *11/02*

U.S. Cl. 23—267 E **10 Claims**



1. An apparatus for chlorinating water, the combination comprising;

a pipe means adapted to have water flowing under pressure therein;

a chlorinating unit containing hypochlorite tablets;

a first conduit means for conducting water from said pipe means to said chlorinating unit;

a second conduit means for conducting a chlorinated solution of water from said unit to said pipe means;

a valve means in said pipe means for diverting a portion of said water flow into said first conduit means;

said chlorinating unit including

a container means for supporting said tablets,

a base, having an inlet bore communicating with said first conduit and an outlet bore communicating with said second conduit,

a tube means centrally carried by said base and communicating with said inlet bore in said base and said container means for conducting water from said inlet bore to said container means and supporting said container a substantial distance above said base.

a conical distribute means, mounted at one end of said tube means and located within said container means, for directing water flowing up said tube means into contact with said tablets,

a plurality of orifices located in said container means adjacent the bottom thereof and in substantially the same horizontal plane as said distributor means, and

dome means removably mounted to said base and enclosing said tube means and said container means for pressurizing said chlorinating unit;

said apparatus being operative so that water is diverted into said container means from said pipe means along said first conduit, said inlet bore and said tube means by operation of said valve means and such water contacts and dissolves said tablets forming a chlorinated solution which solution flows through said orifices, through said outlet, said second conduit and back into said pipe means,

said container means being formed as a right cylinder having an open end at the top and a closed end at the bottom, said closed end having a central bore therein receiving said tube means, and

said container means further including an annular support surface which is solid and flat and is supported above said closed end, said support surface supporting said tablets said orifices being located in the side of said container means above said annular support surface.

3,864,091

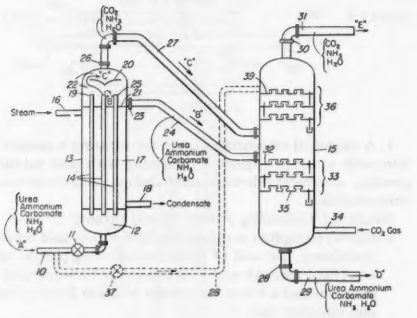
APPARATUS FOR THE DECOMPOSITION OF AMMONIUM CARBAMATE

Ivo Mavrovic, 530 E. 72nd St., New York, N.Y. 10021

Division of Ser. No. 237,644, May 10, 1971,. This application May 24, 1973, Ser. No. 363,328

Int. Cl. B01j *1/00;* **C07c** *127/04;* **F28f** *9/02*

U.S. Cl. 23—283 **3 Claims**



1. A shell and tube decomposer, comprising:

a shell having a bottom section and an upper section;

means defining a heat transfer chamber in said shell;

a plurality of tubes extending in a substantially vertical direction in said shell of said decomposer, said tubes passing through said heat transfer chamber and communicating said bottom section with said upper section and said tubes having upper extremities extending above an upper surface of said heat transfer chamber;

a first outlet located at or below the upper extremities of said tubes to remove substantially all liquid phase decomposition products from said decomposer and preventing substantially all of said liquid phase from reentering said tubes;

a second outlet in said upper section above said first outlet and above the upper extremities of said tubes; and

a deflector element located in said upper section above the upper extremities of said tubes, below said second outlet, spaced from said shell and arranged to deflect said liquid phase downwardly and toward the outer portions of said shell to substantially prevent reentry of the deflected liquid phase into said tubes to allow said gas phase to pass therearound to said second outlet.

3,864,092

PRESSED METAL SCRAP BLOCK AND METHOD OF RECOVERING SCRAP METAL

Benjamin D. Ravitz, Pontiac, Mich., assignor to Harold D. Lipsitz, Royal Oak, Mich., a part interest

Continuation of Ser. No. 162,196, July 13, 1971, abandoned. This application Apr. 19, 1973, Ser. No. 352,545

Int. Cl. B21c *37/00*

U.S. Cl. 29—186 10 Claims

1. An article of manufacture for recovering metal scrap for remelting purpose comprising a block made of fragmentary pieces of scrap metal and a binder material compressed into a block under heavy pressure, said binder material consisting essentially of cement and said block including at least one opening extending therethrough from a surface thereof to an opposite surface, whereby subsequent conversion of the block to a molten state in a furnace is facilitated by heat convection and molten material circulation through said opening.

3,864,093

HIGH-TEMPERATURE, WEAR-RESISTANT COATING

Thomas A. Wolfla, assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 17, 1972, Ser. No. 307,345

Int. Cl. B32b *15/00*

U.S. Cl. 29—195 3 Claims

1. A high-temperature, wear-resistant coated article comprising a solid structural substrate having a single coated layer of metal oxide particles substantially uniformly dispersed in a metal alloy matrix; at least one of said metal oxide particles selected from the group consisting of aluminum oxide, chromium oxide, beryllium oxide, calcium oxide, titanium oxide, niobium oxide, thorium oxide, zirconium oxide, tantalum oxide, silicon oxide, magnesium oxide, hafnium oxide, yttrium oxide, rare earth oxides, and the spinel combination of the above metal oxides, sized between about 0.05 micron and about 74 microns, and present in a volume fraction of between about 2% and about 50%; said metal alloy matrix comprising essentially at least one first metal selected from the group consisting of iron, cobalt and nickel, and at least one second metal selectaed from the group consisting of aluminum, silicon and chromium, the aggregate of said first metal being at least 40% by weight of the alloy and the aggregate of said second metal being between about 10% and about 40% by weight of the alloy; the surface hardness of said coated layer being at least 500 VHN as determined using a 300 gram test load and the coated layer having a microstructure consisting of a thin lamellar structure of interlocking and overlapping microscopic leaves mechanically bonded to each other and to said substrate.

3,864,094

FUEL COMPOSITION

Harry B. Locketz, La Crosse, Wis., assignor to Cryogenic Recycling International Inc., LaCrosse, Wis.

Filed Apr. 16, 1973, Ser. No. 351,138

Int. Cl. C10l *5/00*

U.S. Cl. 44—1 G 3 Claims

1. An improved combustible fuel product, for use in coal-burning heating systems, characterized by a heat value substantially equivalent to coal so as to permit substitution thereof in said heating systems, which burns with low emissions so as to reduce polluting discharges, and consists essentially of lignite and cryogenically reclaimed rubber tire fragments in an amount effective to adjust the heat value of the fuel to substantially the heat value of the substituted for coal, said fragments being obtained by exposing rubber tire scraps to cryogenic temperatures so as to embrittle the rubber therein and striking said embrittled tire so as to shatter said tire into fragments of a size sufficiently small for use as a fuel.

3,864,095

ANTI-KNOCK INJECTION FOR IN-LINE BLENDING OF GASOLINE

John T. Sinclair, and Franklin P. Clark, both of Sarnia, Ontario, Canada, assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 26, 1973, Ser. No. 427,644

Int. Cl. C10l *1/30*; G05d *11/02*

U.S. Cl. 44—2 7 Claims

1. A method of adding a dilute solution containing a constant fraction of lead alkyl compounds to a gasoline stream after in-line blending of the hydrocarbon components thereof and before storage of said gasoline comprising the steps of:

a. analyzing the octane value of said blended gasoline stream after the addition of said lead alkyl compounds;

b. establishing a primary circulating loop stream for addition of lead alkyl compounds by withdrawing a portion of said gasoiline stream, adding lead alkyl compounds to said portion to produce a dilute solution, and returning said lead alkyl containing primary stream to said gasoline stream downstream of said withdrawal point;

c. establishing secondary and tertiary streams by dividing said primary stream before said lead alkyl compounds are added;

d. controlling the volumetric flow rate of said secondary stream to maintain a constant flow rate through an eductor means for adding said lead alkyl compounds to said secondary stream;

e. controlling the addition of lead alkyl compounds to said secondary stream according to the octane value measured in (a);

f. adjusting the flow rate of said tertiary stream in a constant proportion to the addition rate of said lead alkyl compounds;

g. merging said secondary and tertiary streams to form said lead alkyl containing primary stream of (b) thereby providing a constant lead alkyl concentration in said merged streams.

3,864,096

PROCESS FOR CONVERTING CELLULOSE

Peter Urban, Northbrook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 4, 1973, Ser. No. 321,112

Int. Cl. C10j *1/00*

U.S. Cl. 44—50 6 Claims

1. A process for converting cellulose to a normally liquid hydrocarbonaceous product which comprises contacting paper with water, a reducing gas and ammonia at conversion conditions including a temperature of about 200°C. to about 375°C. and a pressure sufficient to maintain at least a portion of the water as a liquid phase, and recovering the hydrocarbonaceous product from the resulting mixture.

3,864,097

PROCESS FOR CONVERTING CELLULOSE

Peter Urban, Northbrook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 15, 1973, Ser. No. 323,615

Int. Cl. C10j *1/00*

U.S. Cl. 44—50 8 Claims

1. A process for converting cellulose to a normally liquid hydrocarbonaceous product which comprises contacting paper with water, a reducing gas a catalytic compound selected from the group consisting of alkali metal and ammonium sulfides, sulfites and thiosulfates at conversion conditions including a temperature of about 200°C. to about 375°C. and a pressure sufficient to maintain at least a portion of the water as a liquid phase, and recovering the hydrocarbonaceous product from the resulting mixture.

3,864,098

FUEL ADDITIVES

Lewis R. Honnen, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 7, 1974, Ser. No. 431,457
Int. Cl. C10l *1/22*
U.S. Cl. 44—58 **14 Claims**

1. A fuel composition comprising a major amount of a liquid hydrocarbon fuel and from 10 ppm to 4,000 ppm of a N-hydrocarbyl-N-heterocyclic polyamine, other than piperazine, wherein said N-heterocyclic polyamine contains from 2 to about 6 nitrogen atoms and from 2 to about 30 carbon atoms, and said hydrocarbyl substituent contains from 30 to about 300 carbon atoms.

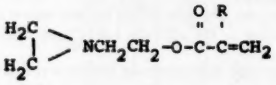
3,864,099

MINERAL OILS CONTAINING COPOLYMERS OF AZIRIDINEETHYL ACRYLATES AND METHACRYLATES: ALKYL ACRYLATES AND METHACRYLATES

Arvid Ek, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 3, 1973, Ser. No. 421,096
Int. Cl. C10m *3/26, 5/20, 7/30*
U.S. Cl. 252—51.5 A **13 Claims**

1. An oil composition which comprises a major amount of a mineral oil and a small amount of an oil-soluble copolymer of (a) a monomeric aziridinyl ethyl carboxylic acid ester having the formula



where R is selected from the group consisting of the hydrogen atom and the methyl group and (b) a monomeric alkyl ester having the formula

$$CH_2{=}CRCOOR_1$$

where R is selected from the group consisting of the hydrogen atom and the methyl group and R_1 is selected from the group consisting of straight- and branched-chain alkyl groups containing 8 to 18 carbon atoms, said copolymer having a molecular weight of at least 20,000 and a ratio of the constituent monomers (a) and (b) in the range of about 1:2 to about 1:99, (a):(b), respectively.

3,864,100

METHOD AND APPARATUS FOR GASIFICATION OF PULVERIZED COAL

Henry John Blaskowski, West Simsbury, Conn., assignor to Combustion Engineering Inc., Windsor, Conn.

Filed Jan. 2, 1973, Ser. No. 320,366
Int. Cl. G10j *3/20*
U.S. Cl. 48—73 **13 Claims**

1. Apparatus for continuously generating a make gas by the reaction at high temperatures of oxygen and steam with a solid fuel containing carbon and ash comprising:

a first vertically extending cylindrical wall;

a second vertically extending cylindrical wall smaller in diameter than and coaxially disposed within said first wall to define an annular reaction chamber therebetween, the lower ends of said first and second walls cooperating to define a bottom for said annular reaction chamber;

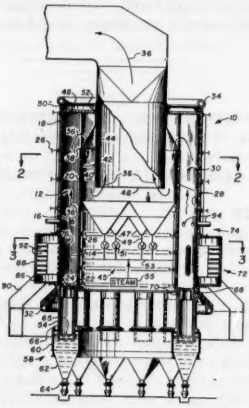
means for discharging molten slag through said bottom of said reaction chamber;

means cooperating with the upper edge of said first wall forming a top for said reaction chamber and extending radially inward of said second wall, said second wall being shorter than said first wall to define a first horizontal flow passageway between the upper edge of said second wall and said top means;

means for discharging make gas from said apparatus comprising a cylindrical duct extending downward through said top means, said duct being smaller in diameter than said second wall and terminating at a level below the upper edge of said second wall to define a vertical flow passageway therebetween;

means extending across the interior of said second wall below the level of termination of said gas discharge duct for preventing the downward flow of gas therebeyond, said means defining a second horizontal passageway with the lower end of said duct;

first nozzle means for introducing into the lower end of said reaction chamber a first quantity of solid fuel in a pulverized state in suspension in a stream of gas containing free oxygen in near stoichiometric proportions, so that combustion of said fuel and gas results in the production of hot products of combustion at a temperature above the fuel ash fusion temperature which rise within said reaction chamber;



second nozzle means for introducing into said reaction chamber, at a location adjacent and above said first nozzle means, a second quantity of solid fuel in a pulverized state in suspension in steam;

whereby said fuel and steam suspension impinges upon said rising hot products of combustion and reacts therewith to form said make gas, said reacting gases rising upward through said reaction chamber, through said first horizontal flow passageway, downward through said vertical flow passageway, through said second horizontal flow passageway and thereafter upward through said discharge duct.

3,864,101

PROCESS FOR PREPARING A RESIN-BONDED GRINDING ARTICLE CONTAINING STRESS-ABSORBING PARTICULATE MATERIAL

Vernon K. Charvat, Bay Village, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Apr. 19, 1972, Ser. No. 244,965
Int. Cl. C08g *51/12, 51/14*
U.S. Cl. 51—298 **15 Claims**

1. A process for preparing a resin-bonded rigid grinding article containing above about 70 percent by weight of the article of abrasive particles wherein said particles are spaced apart in the article by solid-spacer material which comprises

a. preparing an abrasive mixture consisting essentially of

i. a sufficient amount of abrasive particles to provide an abrasive content in the mixture of from about 75 to about 100 percent of the bulk density of the abrasive; said abrasive having a particle size of from about 600 to 10 mesh,

ii. from about 5 to 30 percent by weight of the abrasive particles of stress-absorbing particulate solid spacer material,

iii. from about 10 to 35 percent by weight of the abrasive particles of a liquid-binding resin capable of being cured to a solid without a substantial change in volume,

b. filling the mold with the abrasive mixture without substantially compressing said mixture, and

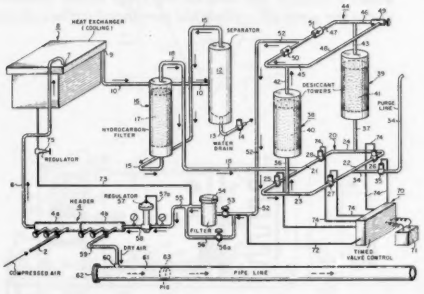
c. curing the abrasive mixture in the mold in the absence of a significant amount of external pressure and change in volume to form a rigid-grinding article having the shape and volume substantially as that of the mold.

3,864,102

DEHYDRATION OF A PIPELINE WITH A PORTABLE DRY AIR GENERATING PLANT

Marvin D. Powers, Houston, Tex., assignor to Pipeline Dehydrators, Inc., Houston, Tex.

Filed June 25, 1973, Ser. No. 373,220
Int. Cl. B01d *53/04*
U.S. Cl. 55—30 **2 Claims**



1. A process for dehydrating a pipeline adapted to carry fluids, said pipeline containing undesired water, said process comprising:

moving to said pipeline a towable dehydration plant;

compressing with said plant near the pipeline ambient air; cooling the compressed air to condense water and oil therefrom;

filtering oil vapor out from the cooled air, and removing a sufficient amount of water vapor from the oil-free air to produce water-absorbing dry air;

propelling a cylindrical pig through said pipeline with said dry air, thereby causing said pig to physically push the water downstream and said air to absorb water; and

removing from the downstream end of the pipeline the water saturated air, the pig, and the water pushed by said pig.

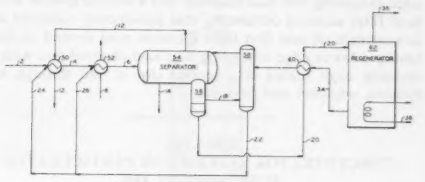
3,864,103

DEHYDRATION OF GASES

William F. Tuckett, and Ivan A. Peterson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 21, 1973, Ser. No. 362,238
Int. Cl. B01d *53/14*
U.S. Cl. 55—32 **7 Claims**

1. In a process for dehydrating a hydrocarbon gas stream containing moisture, wherein said gas is contacted in a contacting zone with a liquid desiccant and the resulting mixture is thereafter chilled to a temperature sufficient to condense the high boiling constituents of said hydrocarbon gas stream, then separated into a gaseous component containing low boiling gaseous constituents, a first liquid stream containing high boiling gaseous components and a second liquid stream containing said desiccant and absorbed moisture, wherein said desiccant containing moisture stream is regenerated to remove absorbed moisture, the improvement which comprises recycling a major portion of said separated desiccant containing moisture so as to increase the moisture content thereof, passing a lesser portion of said separated desiccant containing



moisture stream to a regeneration zone wherein most of said absorbed moisture is removed and admixing the thus-regenerated desiccant with said recycling desiccant containing moisture stream, which resulting admixture is thereafter introduced to said contacting zone.

3,864,104

PROCESSES FOR THE PREPARATION OF CHLOROIMINOPHOSGENE

William S. Durrell, Chappaqua, N.Y., and Robert J. Eckert, Jr., Mobile, Ala., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 256,690, May 25, 1972, Pat. No. 3,801,483, which is a continuation-in-part of Ser. No. 862,519, Sept. 30, 1969, abandoned. This application Oct. 5, 1973, Ser. No. 403,742
Int. Cl. B01d *53/14*
U.S. Cl. 55—71 **1 Claim**

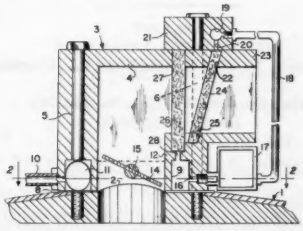
1. A process for concentrating and isolating chloroiminophosgene contained in cyanogen chloride gas streams as co-produced by-product which comprises absorbing said gas stream in an inert organic solvent, stripping the cyanogen chloride from the solution obtained, and separating the solvent from the chloroiminophosgene solution by distillation.

3,864,105

CARBURETOR

William E. Davis, P.O. Box 1705, Stuart, Fla. 33494

Filed Sept. 5, 1973, Ser. No. 394,525
Int. Cl. F02m *17/28*
U.S. Cl. 55—259 **5 Claims**



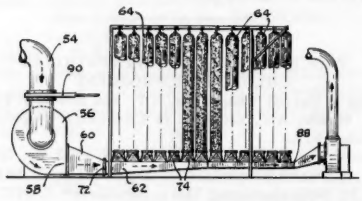
1. In a carburetor, a housing defining a through passageway including an inlet for ambient air at a first end, and an outlet for explosive fuel vapor at a second end, first means for attaching said outlet end to the intake manifold of an internal combustion engine, in pressure-tight relation therewith, there being a first slot in and through said housing opening into said passageway at the top thereof and adjacent said first end, a first porous absorbent filter element disposed in said passageway between said ends thereof and obturating the same, and

having a first edge fitting and essentially filling said first slot, second means including a conduit opening at its discharge end into communication with said first slot, there also being a channel in said housing opening into said passageway, opposite to and below said slot, said first element having a second edge extending into said channel, and a second porous absorbent filter element obturating said passageway adjacent and downstream of said first filter element, said second element having a lower edge extending into said channel and with its opposite edge sealed in a second slot in and through said housing, adjacent said first slot.

3,864,106
CONCENTRATOR SYSTEM FOR PARTICULATES SUSPENDED IN AIR

Robert E. Brandt, Delavan, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed July 18, 1973, Ser. No. 380,320
Int. Cl. B01d *50/00*
U.S. Cl. 55—288 **7 Claims**



5. In an air filter system wherein a flow of air in a duct carries particulate matter which is to be removed from the air, a filter unit comprising

a plenum formed by a duct extending substantially horizontally between opposite ends, having

an inlet at one end into which air bearing particulate matter is introduced,

an outlet at the other end leading to a collection chamber, a bottom therebetween sufficiently smooth for particulate matter to be swept therealong to and through said outlet by said air, and

a plurality of apertures in the top wall thereof, and

a plurality of filter bags connecting with said apertures,

the vertical velocity of air rising through said apertures being less than 400 feet per minute when a horizontal air velocity of 4,000 feet per minute is maintained in said plenum.

3,864,107
AIR CLEANING APPARATUS

Joseph F. Baigas, Jr., 4901 Sentimen Post Rd., Charlotte, N.C. 28203

Filed Dec. 20, 1972, Ser. No. 316,758
Int. Cl. B01d *50/00*
U.S. Cl. 55—290 **7 Claims**

1. Apparatus for cleaning air in textile mills and the like, comprising:

elongate housing means;

means for passing air from which particulate matter is to be removed through said housing means;

a plurality of air-cleaning means disposed within and enclosed by said housing means for progressively cleaning the air during its passage through said housing means;

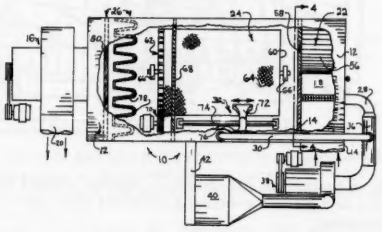
said air-cleaning means including partial-cyclone means disposed within said housing means and comprising a generally C-shaped baffle member extending through an arc distance of no more than approximately 180° about a substantially horizontal axis;

said means for passing air through said housing means including an inlet duct communicating with said housing means and said baffle member adjacent one end of said baffle member for directing incoming air and particulate matter substantially tangentally against the concave inner surface of said baffle member;

adjustable velocity-regulating valve means within said housing means for regulating the velocity of air and entrained particulate matter introduced into such partial-cyclone means through said inlet duct, said valve means comprising a plate-like member pivotally mounted within said inlet duct, and valve operating means connected to said plate-like member for varying the pivotal position thereof and for thereby varying the effective flow-area of said inlet duct;

a purge outlet adjacent the end of said baffle member opposite from said one end thereof for receiving particulate matter directed thereto along said baffle member by centrifugal force;

rotating-drum filter means disposed within said housing means downstream from said partial-cyclone means for receiving and further cleaning partially-cleaned air discharged from said partial-cyclone means, said drum filter means including a generally cylindrical drum rotatable about a central axis and having filter media extending about the generally cylindrical peripheral surface thereof



for filtering the air passing therethrough and into said drum, and further having at least one open end for discharging the filtered air in a generally axial direction from said drum through said open end thereof;

additional filtering means disposed within said housing means downstream from said drum filter means for receiving the air discharged from said drum-filter means and for further filtering the same prior to passage of the air from said housing means;

particulate-matter separating means disposed exteriorally of said housing means;

stripping means disposed within said housing means for stripping particulate matter from said media of said rotating-drum filter means;

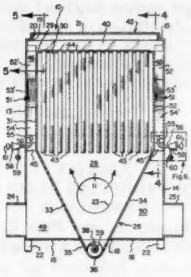
means including a plurality of conduits for conducting particulate matter from said purge outlet of said partial-cyclone means and from said stripping means associated with said rotating-drum filter means to said particulate-matter separating means;

and a return conduit for returning exhaust air from said particulate matter separating means to the interior of said housing means at a location therein downstream from said partial-cyclone means and adjacent said rotating drum-filter means.

3,864,108
DUST COLLECTOR WITH JET INDUCED REVERSE AIR CLEANING

Roger S. Brookman, East Aurora, N.Y., assignor to American Precision Industries, Inc., Buffalo, N.Y.

Filed May 29, 1973, Ser. No. 364,963
Int. Cl. B01d *46/04*
U.S. Cl. 55—302 **10 Claims**



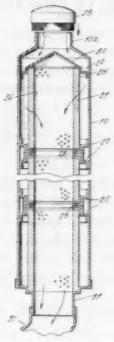
1. A dust collector, comprising:
a first enclosure defining an entrance chamber arranged to receive entrance gas laden with particulate material, said first enclosure having a first wall provided with an outlet opening and also having a second wall;
a gas-permeable filter medium closing said opening to separate said particulate material from cleaned gas passing through said filter medium;
a second enclosure joining said first wall to define a reception chamber to receive said cleaned gas;
first conduit means having a third wall operatively joining said second wall to provide a first conduit communicating with said reception chamber to convey a first flow of cleaned gas thereaway in a normal direction; and
first venturi jet pump means arranged in said first conduit and selectively operable to cause cleaned gas to flow in a direction opposite to said normal direction for abruptly raising the pressure on the cleaned gas side of said filter medium to shock off particulate matter collected on the opposite side thereof.

3,864,109
AIR FILTER

Erik J. Hansen, Ann Arbor, Mich., assignor to Inter-Nation Research Corporation, Ann Arbor, Mich.

Division of Ser. No. 329,116, Feb. 2, 1973, , which is a continuation-in-part of Ser. No. 73,714, Sept. 21, 1970, abandoned. This application June 26, 1974, Ser. No. 483,396
Int. Cl. B01d *50/00*
U.S. Cl. 55—324 **4 Claims**

1. An air filter for use with internal combustion engines which comprises a substantially cylindrical housing, the top portion of which terminates in an air-inlet portion, a filtered air outlet disposed through the bottom of said housing, a plurality of filter elements having a central opening and a perforated cover placed one atop the other inside the housing, said filter elements being substantially equidistantly spaced from the interior cylindrical walls of the housing and means

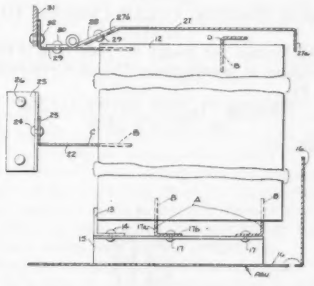


for deflecting air around the filter elements and means for covering the central opening in the uppermost filter element.

3,864,110
SUPPORT ASSEMBLY FOR ELIMINATOR BLADES

Floyd H. Wyman, 220 Edgemont Dr., Mauldin, S.C. 29662, and John E. Chambers, 323 E. Parkins Mill Rd., Travelers Rest, S.C. 29607

Filed Dec. 29, 1972, Ser. No. 319,747
Int. Cl. B01d *45/08*
U.S. Cl. 55—440 **4 Claims**



1. A support assembly for eliminator blades used to separate particles from a moving gas stream comprising: a base including a plurality of spaced bars extending transversely of a plurality of spaced vertical eliminator blades; said bars having a plurality of aligned grooves therein, spaced in accordance with the spacing of the blades, receiving a marginal base portion of a blade in respective grooves; at least one such transverse bar spaced above the base, the grooves of which receive a marginal side portion of a blade in respective grooves; and a movable detached bar having such grooves therein insertable transversely adjacent the top of said blades, the grooves of which receive a marginal portion of a blade in respective grooves; whereby the blades may be readily installed and removed for cleaning.

3,864,111
REDUCING STRESS BIREFRINGENCE IN FUSED SILICA OPTICAL ELEMENTS

James C. Kemp, 1945 Kincaid St., Apt. 1, Eugene, Oreg. 97403

Filed Aug. 8, 1973, Ser. No. 386,645
Int. Cl. C03c *15/00*
U.S. Cl. 65—31 11 Claims

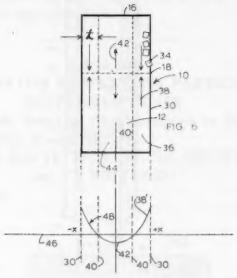


FIG. 5

1. The method of reducing stress-birefringence in fused-silica and fused-quartz light-transmitting elements by etch removal of stressed surface layers of the light-transmitting elements comprising:

covering light-transmitting surface areas of the optical element with an etchant resistant substance,

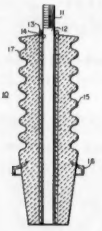
subjecting the selectively covered optical element to an etchant corrosive to the optical element substrate for a period of time sufficient to remove mechanically abraded or thermally effected layers of the substrate under static compressional stress (typically 0.001 inch to 0.004 inch), and

removing by means of the etchant uniaxial strain directed in the plane of light-transmitting faces which strain gives rise to stress-birefringence.

3,864,112
METHOD OF FORMING A GLASS-CERAMIC TO METAL SEALS

Douglas M. Mattox, and Joseph W. Toth, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 31, 1973, Ser. No. 411,542
Int. Cl. C03c *27/04*
U.S. Cl. 65—43 12 Claims



1. A method of bonding an insulating material to a metal member comprising the steps of:

A. applying a coating of a boron containing aqueous solution having a temperature of between about 25°–100°C and comprising 0–10 weight percent H_3BO_3 and 10–30 weight percent $Na_2B_4O_7$, wherein the weight ratio $H_3BO_3 + Na_2B_4O_7$:H_2O is between about 1:1.5 and 1:9, to a metal member having a coefficient of thermal expansion between about 5×10^{-6} in/in/°C to 18×10^{-6} in/in/°C;

B. drying the applied solution to form a boron precipitate coating having a thickness of between about 25–150 microns;

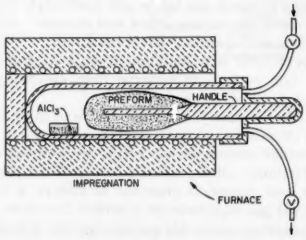
C. applying a molten glass insulating material, directly to the coated metal member, and heating the insulating material and coated metal member up to a temperature of between about 500°–900°C, at a temperature rate effective to simultaneously form a solid insulating layer selected from the group consisting of glass, and glass-ceramic having a coefficient of thermal expansion between about 0 to 17×10^{-6} in/in/°C, and a boron glass coating about 25–150 microns thick consisting essentially of 30–50 weight percent Na_2O and 50–70 weight percent B_2O_3, having a coefficient of thermal expansion between about 8×10^{-6} in/in/°C to 20×10^{-6} in/in°C, between the metal member and the insulating layer; and then

D. cooling the insulated metal member to room temperature.

3,864,113
METHOD OF PRODUCING GLASS BY FLAME HYDROLYSIS

William H. Dumbaugh, Jr., and Peter C. Schultz, both of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 19, 1973, Ser. No. 407,917
Int. Cl. C03c *25/02*
U.S. Cl. 65—60 9 Claims

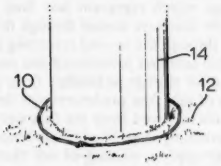


1. A method of incorporating an oxide additive into a glass body produced by flame hydrolysis which comprises passing a hydrolyzable compound of SiO_2, B_2O_3, GeO_2, P_2O_5, SeO_2, TeO_2, or a mixture thereof in vapor form into a flame to produce the corresponding oxide in particulate form by hydrolysis of said compound, depositing the oxide particles on a support as an integral preform having a network of continuous open pores throughout its mass, said porosity being less than about 90 percent and said pores having a diameter not less than about 0.001 micron, positioning said preform in a heated, enclosed space containing vapors of an oxide additive, or a compound convertible thereto, which thermally vaporizes at a temperature below the consolidation temperature of the preform, to introduce such vapors into the pores of the preform, cooling the preform in the said vapors to condense the vapors in the pores, heat treating the preform to consolidate it into a non-porous glassy body composed of the oxide of hydrolysis containing the additive oxide dispersed throughout at least a portion of the body.

3,864,114
SOIL TREATMENT

William Edward Green, 2561 Bloor St. W., Apt. 11, Toronto, Ontario, Canada

Filed Mar. 27, 1972, Ser. No. 238,039
Int. Cl. A01n
U.S. Cl. 71—3 1 Claim



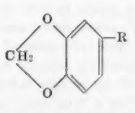
1. In a method for manufacturing a composite article of the type employed for the controlled application of an active chemical to the soil through use of a carrier of an active chemical impregnated string, the improvement comprising the steps of selecting a length of compressible adsorbent yarn derived from spun filaments of regenerated cellulose, an active chemical composition including at least one of a herbicide, plant growth regulator or plant nutrient suitable for use in the treatment of the soil and a degradable adhesive substantially inert to the activity of said chemical composition and to said yarn; then combining said active chemical composition and said degradable adhesive into a blend of substantially uniform consistency; then contacting said yarn with said blend in a manner whereby said yarn is substantially saturated with said blend; then compressing said saturated yarn to expel excess blend and to substantially uniformly distribute said blend throughout the extent of said yarn; and then subjecting said compressed yarn and blend to conditions of controlled temperature to dry the same without decomposition.

3,864,115
4-SUBSTITUTED 1,2-METHYLENE DIOXYBENZENE COMPOUNDS AS PLANT GROWTH REGULANTS

Gerhard Schrader, Wuppertal-Cronenberg, and Klaus Lurssen, Koenigsdorf, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 6, 1972, Ser. No. 269,373
Claims priority, application Germany, July 10, 1971, 2134499
Int. Cl. A01n 9/28
U.S. Cl. 71—88 8 Claims

1. Method of influencing plant growth which method comprises applying to the locus thereof a 4-substituted 1,2-methylene dioxybenzene compound of the formula



in which R is alkyl or alkenyl, each of which may be substituted one or more times by halogen, hydrocarbyl arylthio or halogenated hydrocarbyl arylthio, wherein said alkyl or alkenyl contain not more than 4 carbon atoms, in an amount effective to influence plant growth.

3,864,116
SELECTIVE TROPICAL CROP HERBICIDES

Reed W. Varner, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 23, 1973, Ser. No. 335,117
Int. Cl. A01n 9/22
U.S. Cl. 71—92 10 Claims

1. A method of controlling weeds in tropical crops comprising applying to the locus of the crops an effective amount of at least one uracil selected from the group consisting of 5-bromo-6-methyl-3-neopentyluracil and 5-chloro-6-methyl-3-neopentyluracil.

3,864,117
HERBICIDAL AGENTS

Joachim Gante, and Gerhart Schneider, both of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed June 25, 1971, Ser. No. 156,957
Claims priority, application Germany, June 27, 1970, 2031942
Int. Cl. A01n 9/24
U.S. Cl. 71—115 8 Claims

1. A method of combatting weed grasses which comprises applying thereto a herbicidally effective amount of a composition containing as an essential active ingredient at least one of α,β-dichloro-β-phenylpropionic acid or an alkali-metal or ammonium, salt thereof.

3,864,118
METHOD FOR PRODUCING MANGANESE OXIDE PELLETS

Charles R. Schumacher, Easton; Ezekiel Dominguez, Bethlehem, and Gordon H. Crouch, Bechtelsville, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Feb. 7, 1973, Ser. No. 330,367
Int. Cl. C22b 1/16
U.S. Cl. 75—3 21 Claims

1. A method for producing manganese oxide pellets containing not less than 48% manganese, not more than 6.0% iron, not more than 4.0% silica, not more than 7.0% alumina, not more than 1.0% alkali metals, not more than 0.12% arsenic and characterized by having a manganese to iron weight ratio of not less than about 8:1 and not more than 20:1, a porosity of 5% to 15% and a tumble index of 90% to 95%, from a manganese-bearing material which has been beneficiated to produce a manganese oxide concentrate containing about 35% to 50% manganese, about 10% to 15% iron, up to about 2.2% alkali metals, about .18% to about .25% arsenic, about 3% to about 8% water of hydration, a manganese to iron weight ratio of not more than about 7:1, substantially all the manganese particles being manganese dioxide and substantially all the iron particles in the concentrate being non-magnetic iron oxides, said method comprising:

a. roasting the manganese oxide concentrate at a temperature for a time in a reducing atmosphere to reduce substantially all the manganese dioxide particles to manganomanganic oxide and a minor portion of manganous oxide, to reduce a major portion of the non-magnetic iron oxide particles to magnetic iron oxide particles, and to remove substantially all the water of hydration,

b. magnetically separating the magnetic iron oxide particles from the non-magnetic particles in the concentrate to form a magnetic concentrate which is passed to waste and a non-magnetic concentrate,

c. treating the non-magnetic concentrate to remove a substantial portion of the potassium oxide from the non-magnetic concentrate and to produce a concentrate suitable for balling,

d. balling the non-magnetic concentrate,

e. charging the balled non-magnetic concentrate into a furnace,

f. heating the balled non-magnetic concentrate to a temperature for a time to remove a major portion but not all of the arsenic and to form pellets,
g. cooling the pellets, and
h. discharging the pellets from the furnace, said steps (a) through (g) being carried out under such conditions to produce said manganese oxide pellets having the aforesaid composition and physical properties.

19. In a method for producing manganese oxide pellets containing not less than 48% manganese, not more than 6.0% iron, not more than 4.0% silica, not more than 7.0% alumina, not more than 1.0% alkali metals, not more than 0.12% arsenic, suitable for use in manufacturing ferromanganese alloys, from the group consisting of high grade manganese ores, medium grade manganese ores and low grade manganese ores, said ores containing arsenic and potassium, in the form of insoluble potassium compounds, wherein the manganese ores are upgraded in a physical ore processing plant to produce a manganese oxide concentrate containing about 35% to 50% manganese, about 10% to 15% iron, about .18% to about .25% arsenic and about 2.00% potassium, said pellets characterized by having a porosity of 5% to 15% and a tumble index of 90% to 95%, said method comprising:

a. roasting the manganese oxide concentrate at a temperature for a time in a reducing atmosphere to reduce substantially all the manganese dioxide (MnO_2) to manganese oxide (Mn_3O_4) and a minor portion of manganous oxide (MnO) and a major portion of the non-magnetic iron oxide (Fe_2O_3) to magnetic iron oxide (Fe_3O_4), simultaneously converting a major portion of insoluble potassium compounds therein to water soluble potassium compound, and removing substantially all the water of hydration therefrom,
b. grinding the roasted concentrate to liberation and balling size,
c. magnetically separating the magnetic iron oxides from non-magnetic iron oxides and manganese oxides to form a magnetic concentrate and a non-magnetic concentrate,
d. discarding the magnetic concentrate,
e. treating the non-magnetic concentrate to remove a substantial portion of the soluble potassium compounds and to produce a non-magnetic concentrate suitable for balling,
f. balling the non-magnetic particles to form balls having a diameter of between about one-fourth inch to about three-fourths inch,
g. charging the balls into a traveling grate furnace,
h. drying the balls,
i. heating the balls to a temperature of about 2550° F. to about 2650° F. for about one hour to form pellets, and to remove a major portion but not all of the arsenic therein,
j. cooling the pellets to a temperature of about 150° F. to about 200° F. and
k. discharging the pellets from the furnace, said steps (a) through (j) being carried out under such conditions to produce said manganese oxide pellets having the aforesaid composition and physical properties.

3,864,119

METHOD AND APPARATUS FOR SIMULTANEOUSLY PRODUCING LARGE AND SMALL HEAT HARDENED AGGLOMERATES OF MINERAL ORE

Orion C. Whitaker, Wauwatosa, and Glenn A. Heian, Franklin, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 1, 1973, Ser. No. 402,456
Int. Cl. C21b *1/20*
U.S. Cl. 75—3 **2 Claims**

1. A method of making finished fired and heat hardened agglomerates of finely divided mineral ore of a first predetermined desired agglomerate size and a lesser quantity per unit of time of a second and larger agglomerate size, in a single facility, the method comprising the steps of:

a. making individual green balls of a first preselected size range from finely divided ore;
b. drying, preheating and heat hardening the first size range balls;
c. a first screening of the heat hardened first size range balls to separate therefrom balls of a preselected size larger than the first preselected desired size range when such balls are present and pass therethrough balls within the first preselected size range;
d. a second screening of the heat hardened balls which have passed through said first screening to remove during the second screening preselected size balls from within the first size range which represent less than one half the number of balls that have passed through the first screening, and pass through the second screening the remaining size balls within said first preselected size range which are then collected for storage as finished fired and hardened agglomerates of said first predetermined desired size;
e. rolling the balls removed from the first size range during the second screening step, in additional moistened finely divided ore to apply a coating of ore thereto until the rolling balls grow in diameter to a predetermined larger size to provide the balls of said second predetermined desired agglomerate size; and
f. depositing the coated balls with green balls of the first size range for drying, preheating and final heat hardening of the coating of the coated balls simultaneously with drying, preheating and final hardening of the balls of the first size range, after which the first said screening step screens out the hardened coated balls which are collected to provide the supply of second desired size agglomerates, and the second screening continues to separate finished fired and hardened agglomerates of the first predetermined size from hardened balls of the size preselected for coating.

3,864,120

STABILIZED BURNT LIME PRODUCT AND PROCESS

Helmut Knuppel, Richard-Wagner-Strasse 1, Sulzbach-Rosenberg; Karl Brotzmann, Fentschweg 6,, Sulzbach-Rosenberg Hutte; Hans Georg Fassbinder, Schelmesgraben 20a, Sulzbach Rosenberg, and Peter Wurm, Luisenstrasse 94, Dusseldorf, all of Germany

Continuation-in-part of Ser. No. 28,553, April 14, 1970,. This application July 9, 1973, Ser. No. 377,836
Int. Cl. C21b *1/18*
U.S. Cl. 75—5 **3 Claims**

1. A process for preparing a hydration-resistant lime sinter for use in the reduction of ores in blast furnaces, which comprises:

a. crushing limestone to a particle size of less than 4 mm, and
b. forming a bed of a sinterable mixture which includes said crushed limestone and (1) ferruginous material, the quantities of said material and of the limestone being proportioned so that in the sintered material the ratio by weight of calcium oxide to iron oxide as Fe_2O_3 lies between 3 and 5, (2) coke and/or coal with low gas content and (3) recycled sintered material,
c. moistening the resulting mixture to a water content between 8% and 10% by weight before sintering,
d. igniting said bed for a brief interval of time of about 90 seconds at about 1300°C, and
e. then sintering the mixture of said bed thereby producing a porous burnt lime and simultaneously therewith impregnating said burnt lime with a fluid mixture of calcium oxide and iron oxide.

3,864,121

PROCESS IN THE ROASTING OF ORES FOR REMOVING QUANTITIES OF TIN CONTAINED THEREIN

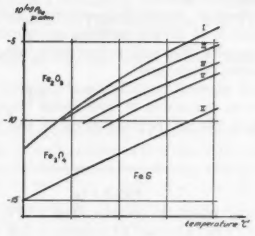
Torsten Eli Jensfelt, Stocksund, and Karl Goran Gorling, Lidingo, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Continuation of Ser. No. 852,610, Aug. 25, 1969, abandoned. This application Aug. 14, 1972, Ser. No. 280,222

Claims priority, application Sweden, Sept. 2, 1968, 11799/68

Int. Cl. C22b *1/10*

U.S. Cl. 75—9 11 Claims



1. A process for volatilizing the tin content of an ore in a one-stage process according to the fluidized bed technique, characterized in that tin-containing ore bearing iron sulphide is continuously introduced into a fluidized roasting bed of said ore in a furnace which is supplied with an oxygen-containing gas in such quantities and at such concentration that the partial pressure of oxygen in the resulting roaster gas lies adjacent but not below the curve which in a binary coordinate system, wherein the partial pressure of oxygen in atmospheres, expressed in terms of log P_0 , as the ordinate, is plotted against the temperature in degrees Centigrade, as the abscissa, passes through the following points:

$Log_{10}P_0$	Temperature °C
− 9.3	1100
−10.8	1000
−12.0	900
−13.4	800
−15.0	700

and that said partial pressure of oxygen does not exceed an analogous curve passing through the following points:

$Log_{10}P_0$	Temperature °C
− 5.4	1100
− 6.7	1000
− 7.9	900
− 9.7	800
−11.7	700

whereafter the roasted goods are separated from the roaster gas at such a temperature that the tin compounds exist in gas form.

3,864,122

METHOD FOR PRODUCING STEEL

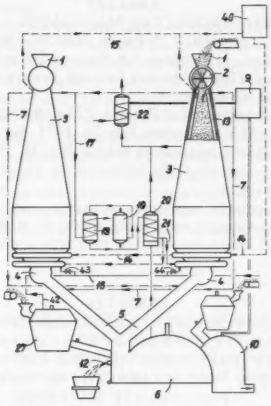
Henri R. Seelig, Essen, and Ritter Von Waclawiczek, Duisburg, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Germany

Filed May 19, 1972, Ser. No. 255,150

Claims priority, application Germany, May 29, 1971, 2126803

Int. Cl. C21c *5/52*; C21b *1/08*, *13/14*

U.S. Cl. 75—11 8 Claims



1. A method for producing steel, comprising the steps of:

a. jacket-heating a plurality of jacketed shaft-furnace units containing iron ore pellets;

b. flowing a reducing gas through the plurality of jacket-heated shaft-furnace units containing iron ore pellets, always from a shaft-furnace unit containing iron ore pellets in a more advanced stage of reduction to a shaft-furnace unit containing iron ore pellets in a less advanced stage of reduction, by flowing a fresh reducing gas through a first unit containing iron ore pellets in an advanced stage of reduction, for directly reducing the iron ore pellets with the reducing gas; and withdrawing the reducing gas from said first unit and flowing it through a second of the plurality of units containing iron ore pellets in a less advanced stage of reduction than the pellets in said first unit for effecting a preliminary direct reduction of the pellets in the second unit;

c. withdrawing pellets reduced to completion from the first unit;

d. protecting the withdrawn pellets from the first unit with at least a part of said reducing gas from the last of the shaft-furnace units through which the reducing gas flows;

e. feeding the withdrawn pellets from the first unit and protecting reducing gas together into an electric furnace;

f. introducing into the first unit new iron ore pellets which are in a less advanced stage of reduction than the iron ore pellets in the second unit and changing the direction of flow of the fresh reducing gas so that it flows into the second unit for bringing about complete direct reduction of the preliminarily reduced iron ore pellets in the second unit and then into the first unit to effect a preliminary direct reduction of the new iron ore pellets in the first unit;

g. withdrawing pellets reduced to completion from the second unit;

h. protecting the withdrawn pellets from the second unit with at least a part of said reducing gas from the last of the shaft-furnace units through which the reducing gas flows;

i. feeding the withdrawn pellets from the second unit and protecting reducing gas together into the electric furnace;

j. introducing into the second unit new iron ore pellets which are in a less advanced stage of reduction than the iron ore pellets in the first unit; and

k. again changing the direction of flow of the fresh reducing gas so that the fresh reducing gas flows into the first unit containing iron ore pellets that have been preliminarily reduced and are ready for complete reduction by the fresh reducing gas.

3,864,123

PROCESS OF PRODUCING MANGANESE CAST STEEL ON HIGH IMPACT STRENGTH

Waclaw Sakwa, ul. Drozdow 1 b, Katowice; Stanislaw Jura, ul. Stowowa 1/27, and Mariusz Labecki, Parkowa 6 m. 3, both of Gliwice, all of Poland

Continuation-in-part of Ser. No. 771,619, Oct. 29, 1968, abandoned. This application July 28, 1971, Ser. No. 166,958
Claims priority, application Poland, Oct. 31, 1967, 123320
Int. Cl. C22c *33/00, 39/30, 39/54*
U.S. Cl. 75—129 **5 Claims**

1. A process for producing austenitic cast steel having a high impact strength comprising adding to molten high manganese steel approximately 0.01 to 0.05% antimony.

3,864,124

PROCESS FOR PRODUCING SINTERED ARTICLES FROM FLEXIBLE PREFORMS CONTAINING POLYTETRAFLUOROETHYLENE AND AT LEAST ABOUT 85 VOLUME PERCENT OF SINTERABLE PARTICULATE MATERIAL

Ernest J. Breton; Jack D. Wolf, and Dexter Worden, all of New Castle, Wilmington, Del. 19801, assignors to Composite Sciences, Inc., Newport, Del.

Continuation-in-part of Ser. No. 818,781, April 23, 1969, abandoned. This application Feb. 28, 1972, Ser. No. 229,823
Int. Cl. B28d *1/32*
U.S. Cl. 75—212 **6 Claims**

1. A process for preparing a sintered article comprising:

a. conforming a self-sustaining, cloth-like, flexible, nonwoven preform to a desired configuration, said preform comprising from about 85 to about 99 % by volume of a solid sinterable particulate material selected from the group consisting of ceramics, metals, intermetallic compounds, synthetic organic polymers and mixtures thereof and from about 1 to about 15 % by volume of polytetrafluoroethylene resin, said particulate material being interconnected and entrapped by fibrils of said polytetrafluoroethylene to impart a self-sustaining condition and flexibility to the preform,

b. heating the preform to a temperature sufficient to decompose and remove the polytetrafluoroethylene resin and to sinter the particulate material thereby bonding the particulate material into a unitary structure, and

c. cooling the product of step b) to obtain the sintered article.

3,864,125

ELECTROPHOTOGRAPHIC METHOD OF MAKING AN IMAGING MASTER

Yasuo Tamai, Asaka, Japan, assignor to Xerox Corporation, Rochester, N.Y.

Division of Ser. No. 222,268, Jan. 31, 1972, Pat. No. 3,806,339, which is a continuation of Ser. No. 8,415, Feb. 3, 1970, abandoned. This application Oct. 29, 1973, Ser. No. 410,867
Claims priority, application Japan, Feb. 10, 1969, 44-9968
Int. Cl. G03g *13/10, 13/22*
U.S. Cl. 96—1 LY **4 Claims**

1. The method of making an imaging master capable of producing multiple prints comprising the steps of forming an electrostatic latent image on an insulating recording member, developing the electrostatic latent image with a liquid developer comprising an electrically insulating liquid having an electrical resistivity greater than about 10^{10} ohm-cm. and having dispersed therein

1. finely divided, substantially colorless, polypeptide material capable of readily imbibing an aqueous solution of a water-soluble dye, said polypeptide being attractable to said latent image, and

2. colored pigment particles, said pigment particles being present in an amount of from about 1% to about 20% by weight of the polypeptide image to the recording member.

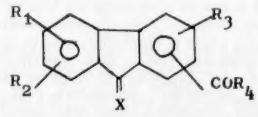
3,864,126

ORGANIC PHOTOCONDUCTOR WITH CARBOXY GROUP CONTAINING FLUORENE OR FLUORORE

Katsuhiko Nishide, Yokohama, and Tsuyoshi Eida, Chiba, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 8, 1974, Ser. No. 431,730
Claims priority, application Japan, Jan. 10, 1973, 48-5774
Int. Cl. G03g *5/06*
U.S. Cl. 96—1.5 **3 Claims**

1. Photosensitive material for electrophotography comprising one or more organic photoconductive materials and one or more compounds of the formula:



wherein R_1, R_2, and R_3 are, the same or different, nitro, cyano, halogen, trifluoromethyl, acyl, lower alkyl, lower alkoxy, aryl, aralkyl, or hydrogen; X is oxygen or malononitrile; and R_4 is, substituted or non-substituted, alkyloxy, alkylamino, aralkyloxy, aralkylamino, aryloxy, or arylamino, containing 4 to 30 carbon atoms, the ratio of said compound to said organic photoconductive material being 0.01 – 120 mols to 100 mols.

3,864,127

METHOD FOR PREPARING ZnO-TiO_2 BICHARGEABLE ELECTROPHOTOGRAPHIC MATERIAL

Hajime Miyatuka, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd, Nakanuma Minami Ashigara-shi, Kanagawa, Japan

Filed Aug. 8, 1972, Ser. No. 279,136
Claims priority, application Japan, Aug. 12, 1971, 46-61142
Int. Cl. G03g *5/08*
U.S. Cl. 96—1.8 **10 Claims**

1. A method for the preparation of an electrophotographic material that can be charged both positively and negatively, which electrophotographic material comprises a powdery mixture of zinc oxide and an oxide of titanium in a molar ratio of 3:1 to 70:1 based on the zinc and the titanium, comprising: obtaining said powdery mixture by adding an organic com-

pound of titanium to a zinc oxide-sol containing water to effect the hydrolysis of the organic compound of titanium and heat-treating said powder mixture at a temperature of 300°–900°C.

3,864,128

ELECTROPHOTOGRAPHIC SHEET MATERIAL EMPLOYING A HYDROPHOBIC FILM SUPPORT AND HYDROPHILIC LAYER

August Jean Van Paesschen, Antwerpen; Lucien Janbaptist Van Gossum, Kontich, and Jan Jozef Priem, Mortsel, all of Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium

Division of Ser. No. 165,312, July 23, 1971, Pat. No. 3,788,856, which is a division of Ser. No. 763,382, Sept. 27, 1968, Pat. No. 3,649,336. This application Feb. 12, 1973, Ser. No. 331,374

Claims priority, application Great Britain, Sept. 28, 1967, 114/67

Int. Cl. G03g *5/00, 5/08*

U.S. Cl. 96—1.8 **10 Claims**

1. A sheet material compirsing a hydrophobic film support, and on one side of said support a first layer directly adherent to said hydrophobic film support and comprising a copolymer formed from 45 to 99.5% by weight of at least one vinylidene chloride or vinyl chloride monomer, from 0.5 to 10% by weight of an ethylenically unsaturated hydrophilic monomer, and from 0 to 54.5% by weight of at least one other copolymerizable ethylenically unsaturated monomer; a second layer adjacent said first layer comprising in a ratio of 1:3 to 1:0.5 by weight a mixture of gelatin and a copolymer of 30 to 70% by weight of butadiene with at least one copolymerizable ethylenically unsaturated monomer; and finely divided particles of a photoconductive compound suited for use in electrophotography uniformly dispersed into a layer of an electrically insulating binder carried on said support other than said first layer.

3,864,129

PHOTOGRAPHIC ACTIVATING BATH

Manfred Schober, Offenbach/Main, Germany, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 12, 1973, Ser. No. 323,316

Claims priority, application Germany, Jan. 24, 1972, 2203116

Int. Cl. G03c *5/26, 1/06*

U.S. Cl. 96—50 R **5 Claims**

1. A photographic activating bath for activating light-sensitive silver halide materials having developer substances incorporated in them, the activating bath consisting essentially of an aqueous solution of an alkaline substance selected from the group consisting of caustic alkali, sodium carbonate, potassium carbonate, aluminates and phosphates, an alkali metal sulfite preservative and at least one water-miscible alcohol of the formula

where r is H, alkul (C_1–C_{12}), aryl, vinyl, $Ch_3O—(CH_2)_n —$, $HO—[(CHR)_2]_n —$; R is H or alkyl; and n is 1–4; in quantities of 10–60 percent by weight.

3,864,130

INTEGRATED OPTICAL CIRCUITS

Heinrich Nassenstein, Leverkusen, and Jurgen Geldmacher, Leichlin, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 229,802, Feb. 28, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 416,918

Claims priority, application Germany, Mar. 2, 1971, 2109687

Int. Cl. G03c *5/00*

U.S. Cl. 96—38.3 **14 Claims**

1. A process for the production of integrated optical elements, for example waveguides, comprising contacting a dielectric radiation sensitive material with a transparent optical medium having a higher refractive index than said radiation sensitive material and illuminating the boundary between the two materials through said transparent medium with electromagnetic radiation at an angle which is greater than the critical angle of total reflection, thereby creating in the radiation sensitive material adjacent the boundary an exponentially decaying surface wave and producing a transition layer having a refractive index gradient in accordance with the exponential decay, the maximum of the refractive index being at the boundary.

3,864,131

DEVELOPER FOR SILVER SALT DIFFUSION TRANSFER PHOTOGRAPHY

Mitsugu Tanaka; Katsumi Hayashi, and Atsuaki Arai, all of Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

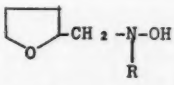
Filed Dec. 26, 1973, Ser. No. 427,878

Claims priority, application Japan, Dec. 25, 1972, 47-259

Int. Cl. G03c *5/54, 5/30*

U.S. Cl. 96—66 R **7 Claims**

1. A developer for diffusion transfer photography, which comprises an alkali, a silver halide solvent and a compound represented by the following general formula,



in which R represents an alkyl group, an alkoxyalkyl group, an alkoxyalkoxyalkyl group, an alkenyl group or a tetrahydrofurfuryl group.

6. The developer of claim 1, wherein said alkali is an alkali metal hydroxide, wherein said silver halide solvent is a thiosulfate, a thiocyanate, thiourea, thioglycolic acid, a cyclic imide compound, or an amine.

3,864,132

ARTICLE HAVING A HYDROPHILIC COLLOID LAYER ADHESIVELY BONDED TO A HYDROPHOBIC POLYMER SUPPORT

Arthur A. Rasch, Webster; Herbert B. Cowden, and David P. Sullivan, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 22, 1972, Ser. No. 255,331

Int. Cl. G03c *1/94*

U.S. Cl. 96—85 **11 Claims**

1. In a photographic article comprising a radiation-sensitive silver salt, a support having a hydrophobic polymer supporting surface, a hydrophilic colloid layer and a subbing layer which is contiguous to said supporting surface and said hydrophilic colloid layer and is bonded to each, the improvement in which said subbing layer is binderless and consists essentially of an inorganic oxide selected from the group consisting of silicon oxide, magnesium oxide, aluminum oxide, tantalum oxide, titanium oxide, boro-silicon oxide and mixtures thereof and is from 10 to 1000 angstroms thick.

3,864,133
PHOTO-POLYMERIZABLE COMPOSITIONS

Hiroyoshi Hisamatsu, Tsurugashima-machi; Katutoshi Takahashi; Masanori Takase, both of Urawa, and Michihiko Shiraishi, Kawaguchi, all of Japan, assignors to Dainippon Ink and Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 171,000, Aug. 11, 1971, abandoned. This application Oct. 19, 1973, Ser. No. 408,094

Claims priority, application Japan, Aug. 11, 1970, 45-169689; Oct. 27, 1970, 45-93967

Int. Cl. G03c 1/70

U.S. Cl. 96—115 P 7 Claims

1. A photo-polymerizable composition containing a polymerizable compound having an average molecular weight within the range of 144 – 100,000, said polymerizable compound having 0.01 – 1.0 urethane linkage based on an average molecular weight of 100, with 0.001 – 1.0 radical or linkage selected from the group consisting of a secondary amino radical, tertiary amino radical, urea linkage or mixture thereof based on an average molecular weight of 100 and 0.02– 1.0 ethylenically unsaturated double bond based on an average molecular weight of 100; and 0.001 – 10 % of a photo-polymerization initiator based on the total weight of the photo-polymerizable composition.

3,864,134
SILVER BROMOIODIDE PHOTOGRAPHIC EMULSION WITH IMPROVED GREEN SENSITIVITY

Hirozo Ueda; Keisuke Shiba, and Akira Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Kanagawa, Japan

Filed Oct. 30, 1972, Ser. No. 301,912

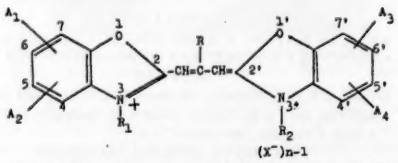
Claims priority, application Japan, Oct. 28, 1971, 46-85835

Int. Cl. G03c 1/14, 1/18

U.S. Cl. 96—124 32 Claims

1. In a silver bromoiodide negative-working photographic emulsion of the developing out type which is subjected to only one exposure followed by wet-developing, said emulsion containing at least one green sensitizing dye to effect green sensitization thereof, a silver bromoiodide photographic emulsion wherein at least 0.01 mol percent of iodide ion based on silver halide adsorbs on the surface of silver bromoiodide grains contained in the emulsion, said iodide ion being in addition to iodine present in said silver iodobromide grains and said green sensitizing dye intensely sensitizing said emulsion to green without substantially deteriorating its photographic properties wherein said green sensitizing dye is represented by one of the following general formulae

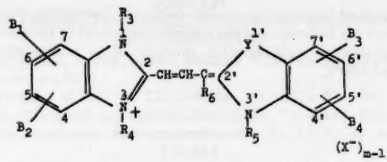
(I)



$(X^-)_{n-1}$

wherein A_1 and A_3 each represents a hydrogen atom or halogen atom, A_2 and A_4 represent a hydrogen atom, halogen atom, hydroxy group, alkoxy group, amino group, acylamido group, acyloxy group, alkoxycarbonyl group, lower alkyl group or alkoxycarbonylamino group, or, when taken together, A_1 and A_2, and A_3 and A_4, can be the atoms necessary to form a benzene nucleus, R represents a hydrogen atom, lower alkyl group, or aryl group, R_1 and R_2 each represents an alkyl group, hydroxyalkyl group, acetoxyalkyl group, alkoxyalkyl group, alkyl group containing a carboxyl group, alkyl group containing sulfo group, benzyl group, phenethyl group or a vinylmethyl group; and

(2)



$(X^-)_{m-1}$

wherein B_1 represents a hydrogen atom or halogen atom, B_2, B_3 and B_4 each represents a hydrogen atom, halogen atom, lower alkyl group, amino group, acylamido group, acyloxy group, alkoxycarbonyl group, carboxyl group, alkoxy group, aryl group, cyano group, carbamoyl group, alkylsulfonyl group, alkylaminosulfonyl group or aminosulfonyl group, or, when taken together, B_3 and B_4 can represent the atoms necessary to form a benzene ring, Y represents —O—

wherein R_7 and R_8 each represents an alkyl group,

$$>N-R_9,$$

wherein R_9 represents an alkyl group, R_3, R_4 and R_5 represent the same alkyl groups as R_1 or R_2; R_6 represents a hydrogen atom or R_5 and R_6 may combine with each other through an alkylene group, and m represents 1 or 2.

3,864,135
FLAME RETARDANT AND INTUMESCENT COMPOSITIONS

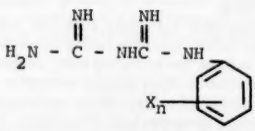
Erich Kuehn, Wilmington, Del., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.

Division of Ser. No. 297,397, Oct. 13, 1972, Pat. No. 3,801,333, which is a division of Ser. No. 104,149, Jan. 5, 1971, Pat. No. 3,728,138, which is a division of Ser. No. 726,538, May 3, 1968, Pat. No. 3,639,535. This application Oct. 26, 1973, Ser. No. 409,895

Int. Cl. C09d 5/18

U.S. Cl. 106—15 FP 10 Claims

1. A flame-retardant polymeric composition containing from about 5% to about 60% by weight of said composition of a flame-retarding agent selected from the group consisting of a mineral acid salt of a compound characterized by the generalized formula:



wherein X is a halogen having an atomic weight greater than 30 and n is a number from 0 to 5 and mixtures of said mineral salt with a phosphorus-containing flame-retardant compound, provided that if said mineral acid salt to be the sole flame-retarding agent, said mineral acid salt be present in a concentration of not less than about 25% by weight of said composition and that if said flame-retarding agent be a mixture providing a concentration of said mineral acid salt of less than about 25% by weight of said composition, the concentration of said phosphorus-containing flame-retardant compound in said polymeric composition be not less than about 4% by weight of said composition.

3,864,136

DIRECT BONDED REFRACTORY BRICK HAVING IMPROVED HOT STRENGTH AND ITS METHOD OF MANUFACTURE

Grant M. Farrington, Jr., Marlton, and Ronald Staut, Cherry Hill, both of N.J., assignors to General Refractories Company, Philadelphia, Pa.

Filed Nov. 5, 1973, Ser. No. 412,917
Int. Cl. C04b *35/42*
U.S. Cl. 106—59 **15 Claims**

1. A direct bonded refractory shape comprising about 30 to about 80 percent by weight magnesia, about 70 to about 20 percent by weight chrome ore, and having an overall lime to silica ratio less than about 0.30 and a silica content of less than about 2.5 percent, based on the total weight of the refractory shape.

3,864,137

HYDROGEN PEROXIDE BLOWING AGENT FOR SILICATE FOAMS

Wulf Van Bonin; Ulrich Nehen, both of Leverkusen, and Ulrich Von Gizycki, Cologne, all of Germany, assignors to Bayer Aktiengesellshaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 318,068, Dec. 26, 1972,. This application May 24, 1973, Ser. No. 363,671
Claims priority, application Germany, Dec. 31, 1971, 2165912; Mar. 25, 1972, 2214609; June 7, 1972, 2227608
Int. Cl. C04b *35/16*
U.S. Cl. 106—75 **5 Claims**

1. In the production of foams by mixing an aqueous silicate solution with a blowing agent and a hardener, molding the mixture, and drying the molded silicate foam, the improvement which comprises using hydrogen peroxide as the blowing agent and using a hardener consisting essentially of a member selected from the group consisting of chloroformic acid esters, chloracetic acid esters, isocyanide dichlorides, sulfochlorides, carboxylic acid chlorides and compounds which contain aliphatically bound labile chlorine.

3,864,138

PROCESS FOR REGULATING SETTING TIME OF HYDRAULIC CEMENT

Hiroshi Uchikawa, Funabashi, and Shunichiro Uchida, Chiba, both of Japan, assignors to Onoda Cement Company, Limited, Onoda-shi, Yamaguchi, Japan

Filed May 15, 1972, Ser. No. 253,352
Claims priority, application Japan, May 22, 1971, 46-34979
Int. Cl. C04b *7/02*
U.S. Cl. 106—89 **7 Claims**

1. A process for regulating the setting time of a hydraulic cement, which consists essentially of: admixing the retarders anhydrite and a silicofluoride with a clinker containing 5–60% by weight of $11CaO.7\ Al_2O_3.CaX_2$, wherein X represents a halogen atom, and more than 5% by weight of 3 $CaO.SiO_2$ solid solution, $2CaO.SiO_2$ solid solution and 4 $CaO.Al_2O_3.Fe_2O_3$; wherein the anhydrite is present in an amount such that the weight ratio of Al_2O_3 in the clinker to SO_3 in the anhydrite is 0.7 to 1.8.

3,864,139

PRETREATMENT COMPOSITIONS AND USE THEREOF IN TREATING METAL SURFACES

Ferdinand P. Heller, Ambler, Pa., assignor to Amchem Products, Inc.,, Ambler, Pa.

Continuation-in-part of Ser. No. 95,364, Dec. 4, 1970, abandoned. This application Jan. 4, 1973, Ser. No. 321,086
Int. Cl. C09k *3/00;* **B44d** *1/34*
U.S. Cl. 106—287 R **1 Claim**

1. A stable aqueous colloidal solution for activating the surface of a metal selected from the group consisting of iron, steel zinc, aluminum, and alloys thereof, on which a zinc phosphate coating is subsequently applied, consisting essentially of:

a. from about 0.05 grams/liter to about 30 grams/liter of an activating composition consisting essentially of disodium orthophosphate and titanium salt, wherein the titanium comprises from about 0.005% to about 20% by weight of said activating composition and the disodium orthophosphate comprises at least 80% by weight of said activating composition;

b. a stabilizing agent selected from the group consisting of alkali citrate and alkali aminopolycarboxylic acid salts, such that for each part by weight of activating composition thre is present from about 2 parts by weight to about 30 parts by weight of stabilizing agent; and

c. water having undesirable alkaline earth metal cations in concentrations of at least 100 parts per million; wherein the concentration of the activating composition plus the stabilizing agent in said solution is from about .15 grams/liter to about 100 grams/liter; and wherein the pH of said solution is fro 5.0 to 10.0.

3,864,140

PIGMENTARY COMPOSITIONS WITH REDUCED WATER ABSORPTION

Thomas Howard Ferrigno, 29 Clover Hill Cir., Trenton, N.J. 08638

Continuation-in-part of Ser. Nos. 306,926, Nov. 15, 1972, , and Ser. No. 356,055, April 30, 1973, , and Ser. No. 164,416, July 20, 1971, abandoned. This application Aug. 22, 1973, Ser. No. 390,525
Int. Cl. C09c *1/28;* **C08h** *17/04*
U.S. Cl. 106—308 Q **14 Claims**

1. A pigmentary composition comprising calcined agglomerates ranging in size from about 20 microns to one centimeter and each embodying a plurality of particles of silicate mineral having an average particle size of from about 0.5 to 20 microns, said particles being bonded together so that the agglomerates have voids therein and a density of from about 60% to 90% of that of said silicate mineral in the agglomerates, said agglomerates having from about 0.005% to 1% by weight of a hydrolizable silane based on the weight of the agglomerates applied thereto and chemically bonded to the outer surface of the agglomerates in the form of a siloxane limiting the water absorption of the agglomerates to less than 10%.

3,864,141

PROCESS FOR REGULATING SETTING TIME OF HYDRAULIC CEMENT

Hiroshi Uchikawa, Funabashi, and Shunichiro Uchida, Chiba, both of Japan, assignors to Onoda Cement Co., Ltd., Onoda-shi, Yamaguchi-ken, Japan

Division of Ser. No. 253,352, May 15, 1972,. This application July 6, 1973, Ser. No. 377,112
Int. Cl. C04b *13/24, 7/02*
U.S. Cl. 106—315 **7 Claims**

1. A process for regulating the setting time of a hydraulic cement, which comprises the steps of:

admixing the retarders anhydrite and 0.01 – 1.0 weight percent of a carboxylic acid with a clinker consisting essentially of 5 – 60 weight percent of 11 $CaO.7Al_2O_3.CaX_2$, wherein X represents a halogen atom, and more than 5 weight percent of 3 $CaO.SiO_2$ solid solution, 2 $CaO.SiO_2$ solid solution and 4 $CaO.Al_2O_3.Fe_2O_3$; wherein the anhydrite is present in an amount such that the weight ratio of Al_2O_3 in the clinker to SO_3 in the anhydrite is 0.7 – 1.8.

3,864,142
METAL OXIDE SOLS

James F. Kovarik, Berwyn, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Continuation-in-part of Ser. No. 137,670, April 26, 1971,. This application Jan. 12, 1973, Ser. No. 323,006
Int. Cl. B01j 13/00
U.S. Cl. 117—100 S 5 Claims

1. A process of preparing metallic oxide coated silica sols which comprise the steps of:

A. adding a metallic chloride to a silica sol having from 5 to 40 percent by weight SiO_2 to form a reaction product, with the amount of the metallic chloride being sufficient to coat from 0.10 to 1.0 of a monolayer of metal oxide which corresponds to the metal of the metallic chloride on the surface of said silica sol;

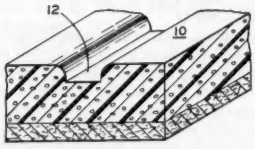
B. treating the reaction product with an anion exchange resin; and

C. recovering the reaction product as the metallic oxide coated silica sol product, said steps being the only steps used in said process.

3,864,143
CHEMICAL EMBOSSING USING ULTRAVIOLET RADIATION

Richard M. Fantazier, Columbia, Pa., and James N. Wells, Cottage Grove, Minn., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed June 22, 1972, Ser. No. 265,141
Int. Cl. B44c 1/02
U.S. Cl. 117—10 2 Claims



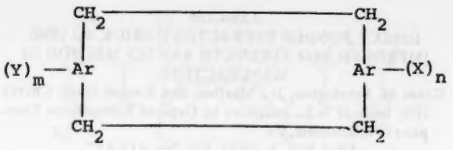
1. The method of obtaining an embossed pattern on a sheet utilizing a plastisol mix containing a decomposable expanding agent, comprising the steps of, preparing a plastisol mix which is capable of being foamed and containing an expanding agent, heating the mix at a point below the decomposition point of the expanding agent to effect its gellation, masking portions of the gelled mix, then exposing the unmasked portions of the gelled mix to ultraviolet radiation which will then decompose the expanding agent in the gelled mix in the unmasked regions without expansion of the gelled mix, said irradiation temperature being insufficient to cause fusion of the gelled plastisol mix, and then subsequently heating the total mix for fusion of the gelled plastisol and to effect expansion of the remaining expanding agent whereby an embossed type product is formed with the masked areas having a greater foam height than the unmasked areas.

3,864,144
PROCESS FOR PREPARATION OF PHOTOCONDUCTIVE FILMS FROM INTRACTABLE MATERIALS

Moshe Levy, Rehovot, Israel; James M. Pearson, Webster, and David J. Williams, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 19, 1973, Ser. No. 342,635
Int. Cl. B44d 1/14; B32b 27/06
U.S. Cl. 117—34 7 Claims

1. A process for preparation of a photoconductive imaging layer from at least one cyclic compound of the formula:

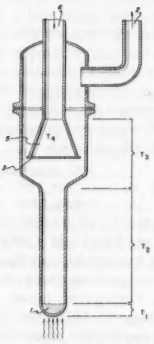


wherein

Ar is a polyaromatic nucleus selected from the group consisting of diradicals of napthalene and anthracene;

X and Y are independently selected from the group consisting of halogen, NO_2, NH_2, lower alkyl, phenyl, phenoxy, carboxy, hydroxyl, lower alkyl esters and aryl esters; and

m and *n* range from 0 to the total number of replaceable hydrogens on the polyaromatic nucleus,



said process comprising:

a. providing a chamber having (1) at least 3 distinct temperature zones spatially arranged so as to enable vaporization, pyrolytic cleavage, condensation and polymerization of said cyclic compounds, (2) means for condensation of vaporized materials, and (3) means for evacuation of said chamber;

b. heating at least one of the above cyclic compounds under vaporizing conditions in the evacuated chamber;

c. cracking the vaporized cyclic compounds by subjecting said compounds to temperatures sufficient to cause pyrolytic cleavage of the compounds;

d. collecting the products of said pyrolytic cleavage by condensation on a electrically conductive substrate, said substrate having been sufficiently chilled so as to forestall and/or retard the polymerization of the condensate deposited thereon; and

e. increasing the temperature of the substrate, thereby, allowing the condensate to polymerize.

3,864,145

PRESSURE SENSITIVE COPYING PAPER

Hiromitsu Seki, and Kenji Yamamoto, both of Osaka, Japan, assignors to Yamamoto Kaguku Gosei Kabushiki Kaisha, Osaka, Japan

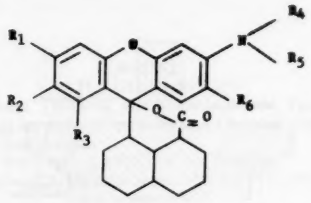
Division of Ser. No. 208,415, Dec. 15, 1971,. This application Nov. 29, 1972, Ser. No. 310,585

Claims priority, application Japan, Dec. 15, 1970, 45-112053

Int. Cl. B41c *1/06*

U.S. Cl. 117—36.2 8 Claims

1. In a pressure sensitive copying paper, a paper sheet having applied thereto at least one fluoran compound of the formula:



wherein R_1, R_2 and R_3 are members selected from the group consisting of hydrogen, methyl and halogen; R_4 and R_5 are both hydrogen or one of R_4 and R_5 is hydrogen, and the other is methyl or ethyl; and R_6 is a member selected from the group consisting of hydrogen, methyl, amino and acetylamino; also R_2 and R_3 when joined together represent a hydrocarbon residue which forms a benzene ring.

3,864,146

SENSITIZED RECORD SHEET MATERIAL

Shinichi Oda, Amagasaki, and Jujiro Kono, Osaka, both of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

No Drawing. Filed June 13, 1972, Ser. No. 262,362

Claims priority, application Japan, June 16, 1971, 46-43546

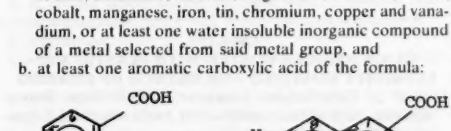
Int. Cl. B41m *5/22*

U.S. Cl. 117—36.8 15 Claims

1. A sheet of record material sensitized with a coating to produce color on contact with colorless chromogenic compounds, said coating comprising a binder, and a color reactant material, said color reactant material consisting essentially of in combination:

a. at least one metal ion selected from the group consisting of zinc, aluminum, calcium, magnesium, titanium, nickel, cobalt, manganese, iron, tin, chromium, copper and vanadium, or at least one water insoluble inorganic compound of a metal selected from said metal group, and

b. at least one aromatic carboxylic acid of the formula:



wherein R is hydroxyl, amino, amino substituted by at least one lower alkyl group having 1 to 5 carbon atoms, nitro or chlorine, and R Group being substituted on one of the carbon atoms at the position adjacent to that of the carboxylic group on the aromatic ring,

X is a substituted or unsubstituted hydrocarbon containing a monocylic or bicylic carbon ring having 6 or 10 carbon atoms,

m is an integer of 1 to 2 and

n is an integer of 1 to 3.

3,864,147

METHOD OF IMPROVING THE BONDING CAPABILITY OF POLYMER SURFACES FOR SUBSEQUENTLY APPLIED COATINGS, AND PRODUCTS THEREOF

John J. Grunwald, New Haven; Eugene D'Ottavio, Thomaston, and Michael S. Lombardo, Waterbury, all of Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

Filed Sept. 25, 1972, Ser. No. 291,717

Int. Cl. B44d *1/092*

U.S. Cl. 117—47 A 15 Claims

1. A process of improving the topography characteristics of a plastic substrate for the bonding thereto of a permanent coating film, which comprises the steps of initially forming by heat and pressure a laminate of the plastic substrate and a sacrificial aluminum metal foil having an oxidized surface facing the substrate, then stripping said sacrificial aluminum metal foil from the laminate thus formed by treatment in an aqueous etchant solution effective to dissolve said sacrificial aluminum metal foil wherein said treatment always includes, either during or subsequent to removal of said metal but before any other treatment, subjecting said substrate to an aqueous solution of phosphoric acid, a soluble pyrophosphate, or both.

2. A process of improving the topography characteristics of a plastic substrate surface for the bonding thereto of a permanent coating film, which comprises the steps of initially forming by heat and pressure a laminate of the plastic substrate and a sacrificial aluminum metal foil having an oxidized surface facing the substrate, chemically stripping in an aqueous etchant solution all visible traces of said sacrificial aluminum metal foil from the surface of the substrate, and then subjecting the stripped substrate to treatment in an aqueous solution of phosphoric acid or a soluble pyrophosphate effective in removing all trace metal oxides from the surface of the substrate after the first etching step, and thereafter rinsing and applying said permanent coating film.

7. In the electroless metal plating of plastic substrates in which a laminate is initially formed by bonding an anodized aluminum foil to a resin substrate by heat and pressure, the aluminum foil being then chemically stripped from the plastic surface, the surface activated and then plated with an adherent film by immersion in an electroless metal plating solution, the improvement which comprises: subjecting the plastic substrate to further chemical treatment, supplemental to the said regular stripping step, to substantially eliminate traces of metal oxides adhering to the surface, wherein said supplemental treatment involves immersing the stripped substrate in a solution of phosphoric acid or soluble pyrophosphate.

14. A process of improving the topography characteristics of a polymerized plastic substrate surface for the bonding thereto of a permanent metallic film, which comprises the step of initially forming a laminate of the plastic substrate and a sacrificial anodized aluminum foil by heat and pressure, chemically stripping said foil from the substrate surface in an aqueous etchant solution of a strong acid or base to remove all visible trace of the metal, supplementing said etchant step by subjecting the stripped substrate to an aqueous solution of phosphoric acid or a soluble pyrophosphate, and thereafter rinsing and electrolessly plating said permanent metallic film on said substrate.

3,864,148

PROCESS FOR PRODUCTION OF METAL-PLATED FIBERS

Minoru Maeıwa, and Morioka, Hiroka, both of Okayama, Japan, assignors to Kuraray Co., Ltd.,, Kurashiki, Okayama prefecture, Japan

Filed Oct. 10, 1972, Ser. No. 296,021

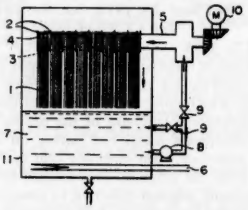
Claims priority, application Japan, Oct. 14, 1971, 46-81135

Int. Cl. B44d *1/092*

U.S. Cl. 117—47 A 6 Claims

1. A process for the production of metal-plated fibers by electrolessly plating pre-treated fibers, which comprises reel-

ing the fibers into hanks, hanging the fibers in the hank form on a rotary cylinder having projection holes to suspend the fibers in the air, wherein the projection holes are from about 2 to about 5 mm in diameter and present in from about 25 to about 150 holes per 100 cm^2 of the cylinder surface, and



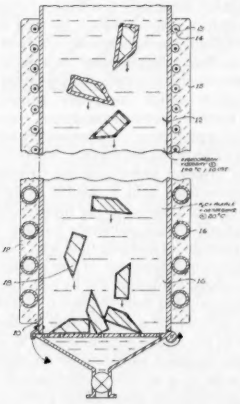
wherein the fibers have a denier of from about 0.1 to about 15, allowing the fibers to move rotatively around the cylinder by rotation of the cylinder, projecting an electroless metal plating solution at a rate of 5 to 50 cm/sec from said projection holes against the rotatively moving fibers and thereby effecting the electroless plating of the fibers.

3,864,149

METHOD OF COATING WORKPIECES WITH THERMOPLASTIC SYNTHETIC RESINS

Werner Scheiber, Frankfurt am Main, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 29, 1973, Ser. No. 375,009
Int. Cl. B44d *1/094, 1/40*
U.S. Cl. 117—64 **9 Claims**



1. A process for coating a workpiece with a thermally-fusible synthetic resin comprising the steps of:

a. heating a workpiece to at least the softening temperature of said resin;

b. adhering particles of said synthetic resin to the workpiece by contacting the heated workpiece with said particles to form a rough fritted layer of said particles on said workpiece;

c. thereafter coalescing and smoothing said layer and fusing said particles into a continuum by treating the workpiece with said layer adherent thereto with a high-molecular-weight liquid hydrocarbon in which said synthetic resin is insoluble at a temperature above the softening point of said synthetic resin, said liquid hydrocarbon having a viscosity at 100°C greater than 10 cSt; and

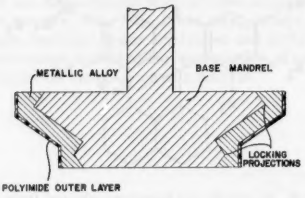
d. thereafter cooling the synthetic-resin layer by treating it with water following step (c).

3,864,150

REUSABLE MANDREL FOR STRUCTURES HAVING ZERO DRAFT OR RE-ENTRANT GEOMETRIES

Robert J. Baird, Indianapolis, Ind., and Thomas G. Everett, Jr., Flanders, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 156,191, June 24, 1971, Pat. No. 3,717,914. This application Oct. 27, 1972, Ser. No. 301,495
Int. Cl. C23c *1/06, 1/10*
U.S. Cl. 117—71 M **7 Claims**



1. a process for fabricating reusable mandrels designed for use in producing free-standing bodies comprising the steps:

a. preparing a base mandrel of a material having a melting temperature above at least 650°C and substantially conforming in shape to a desired body to be deposited thereon and being dimensionally different than said body by a radial distance sufficient to allow for a dual coating build up on said mandrel(;), said body having zero draft angles or re-entrant geometries;

b. depositing a metallic alloy on the surface of the mandrel to substantially conform to the shape of said mandrel, said alloy having a melting temperature below 700°C and lower than the melting temperature of said base mandrel and said base mandrel material being substantially nonreactive with said metallic alloy; and

c. depositing and then curing at least one polyimide layer on said alloy deposited base mandrel to produce an overall coating that substantially conforms to the shape of the alloy coated base mandrel and that will essentially prevent any reaction between said alloy layer and the material of the body to be deposited thereon, said polyimide layer having a higher melting point than said alloy and being non-reactive with and easily separable from the material of the body to be deposited.

3,864,151

GLASS ARTICLE COATED WITH PLASTIC AND LUBRICITY COATINGS AND METHOD OF COATING

Francis J. Shonebarger, Lancaster, and William Brown, Amanda, both of Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Filed July 2, 1973, Ser. No. 375,684
Int. Cl. B32b *17/10;* **C03c** *17/32*
U.S. Cl. 117—72 **12 Claims**

1. The method comprising,

applying a plastic coating to a glass container, the plastic coating comprising an ionic copolymer of an alpha olefin and an alpha, beta-ethylenically unsaturated carboxylic acid,

providing a lubricity coating in the form of a water emulsion and comprising

1 part by weight of a salt of the group consisting of calcium stearate, zinc stearate, calcium oleate, zinc oleate, and mixtures thereof;

about 0.5 to 2 parts of a soluble polyvinyl alcohol,
about 1.5 to 3 parts of oleic acid,
and about 0.3 to .8 part of a hydroxide of the group consisting of potassium, sodium, and ammonium hydroxides, and mixtures thereof,
applying said lubricity coating to said container over said plastic coating at a temperature in the range of about 150° to 200°F.,
and drying the lubricity coating on the container.

3,864,152

COATED GLASS BOTTLE

Shuji Kitamura, Toyonaka, and Kimio Horikoshi, Takatsuki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 2, 1973, Ser. No. 356,450
Claims priority, application Japan, May 24, 1972, 47-51841
Int. Cl. B65d *23/08*
U.S. Cl. 117—73 **4 Claims**

1. A resin-coated glass bottle which comprises a polyvinyl alcohol resin coating layer of a thickness not less than 100 microns on the surface of the bottle, which polyvinyl alcohol resin has a polymerization degree of not less than 500, and a high alkali-resistant resin coating layer on the said polyvinyl alcohol resin layer, which alkali-resistant resin is selected from the group consisting of an epoxy resin, a urethane resin and an ethyl cellulose resin.

3,864,153

WATER RESISTING AND ANTICORROSIVE PAINTING METHOD AND THE PAINTED ARTICLES

Satoru Enomoto, Fukushima, Japan, assignor to Kureha Kagaku Kogyo K.K., Tokyo, Japan

Continuation-in-part of Ser. No. 68,553, Aug. 31, 1970, abandoned. This application Jan. 26, 1973, Ser. No. 326,657
Claims priority, application Japan, Aug. 30, 1969, 44-68350
Int. Cl. B32b *15/08*
U.S. Cl. 117—75 **7 Claims**

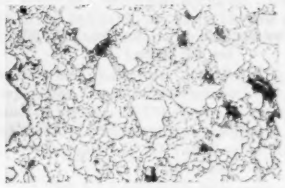
1. A coated article having excellent water-resistance and corrosion-resistance and which is non-bleeding comprising:
1. a substrate;
2. a first layer coated directly on said substrate consisting essentially of 10 to 500 parts by weight of an alkylated polycyclic aromatic compound and 100 parts by weight of a urethane resin, said alkylated polycyclic aromatic compound containing no nitrogen, oxygen or sulfur to the extent detectable by elementary analysis, having a means molecular weight measured by VPO method of from 250 to 600, having an aromatic ring-forming proton density measured by the nuclear magnetic resonance method of from 35 to 80%, having a specific gravity of from 0.95 to 1.10, and, if liquid, having a viscosity of at least 2,000 centipoises at 25° C or, if solid, having a softening point of about 25° C; said first layer further consisting essentially of a hardening agent for the urethane resin; and
3. a second layer coated directly on said first layer consisting essentially of a curable resin selected from the group consisting of an epoxy, a urethane resin and an alkyd resin.

3,864,154

CERAMIC-METAL SYSTEMS BY INFILTRATION

George E. Gazza, Sudbury, Mass., and Michael W. Lindley, Holton Heath, England, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C., by said Gazza and The Secretary of State for Defence Ministry of Defence, London, England, by said Lindley

Filed Nov. 9, 1972, Ser. No. 305,038
Int. Cl. C03c *17/00;* **C04b** *41/00*
U.S. Cl. 29—123 B **6 Claims**



Al B_{12}— Al (500X)

1. A ceramic-metal composition consisting of a metal impregnated into a porous ceramic compact by infiltration, selected from the group consisting of:

	CERAMIC	METAL IMPREGNANT
a)	SiB_6 -	Al
b)	AlB_{12} -	Al
c)	AlB_{12} -	Si
d)	B -	Al
e)	AlB_{12}-B	- Al

3,864,155

GLASS FIBER SIZE AND RESULTING PRODUCT

Roy R. Graham, Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 27, 1973, Ser. No. 355,237
Int. Cl. C03c *25/02*
U.S. Cl. 117—126 GB **8 Claims**

1. In the method of forming chopped glass fiber strand for use as reinforcement for articles formed from aqueous dispersion, which comprises drawing glass streams through orifices in a bushing to form individual glass fibers, moving the fibers away from the bushing at a high rate of speed and forming them into a strand, applying to the fibers while they are moving at this speed and before strand formation an aqueous sizing solution whose solids comprise 40 percent to 93 percent by weight of gelatin, 5.55 percent to 44.6 percent by weight of an n-alkyl N-amidoalkyl imidazoline and 0.95 to 16.7 percent by weight of a solubilized fatty acid amide said sizing solution having a viscosity less than 100 centipoise at 20° C., drying the strand so formed and chopping said strands.

3,864,156

PROCESS FOR FLAMEPROOFING SYNTHETIC TEXTILES AND THE FIRE RETARDANT TEXTILE FORMED THEREFROM

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 23,493, March 27, 1970, abandoned. This application July 10, 1972, Ser. No. 270,110
Int. Cl. C09d *1/00;* **B44d** *1/50*
U.S. Cl. 117—136 **18 Claims**

1. A process for flameproofing synthetic textiles which comprises:

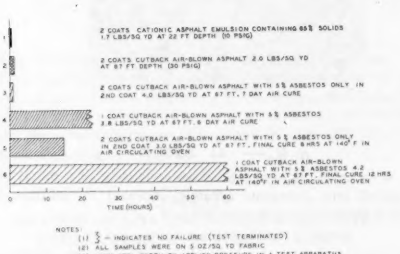
a. applying an aqueous solution containing a polycondensed vinylphosphonate monomer to a synthetic textile; and
b. curing the monomer on said textile so as to affect the polymerization of said monomer in situ on said textile to render the textile flame retardant.

3,864,157

IMPERVIOUS BARRIER COMPRISING POLYOLEFIN FABRIC, ASPHALT AND ASBESTOS

Clarence R. Bresson, and Forrest D. Spaulding, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 14, 1971, Ser. No. 207,800
Int. Cl. B32b *27/00*
U.S. Cl. 117—138.8 E **2 Claims**


2 COATS CATIONIC ASPHALT EMULSION CONTAINING 65% SOLIDS 1.7 LBS/SQ YD AT 22 FT DEPTH (10 PSIG)
2 COATS CUTBACK AIR-BLOWN ASPHALT 2.0 LBS/SQ YD AT 87 FT DEPTH (30 PSIG)
2 COATS CUTBACK AIR-BLOWN ASPHALT WITH 5% ASBESTOS ONLY IN 2ND COAT 4.0 LBS/SQ YD AT 87 FT., 7 DAY AIR CURE
1 COAT CUTBACK AIR-BLOWN ASPHALT WITH 5% ASBESTOS 3.8 LBS/SQ YD AT 87 FT., 6 DAY AIR CURE
2 COATS CUTBACK AIR-BLOWN ASPHALT WITH 5% ASBESTOS ONLY IN 2ND COAT 4.0 LBS/SQ YD AT 87 FT., FINAL CURE 6 HRS AT 140°F IN AIR CIRCULATING OVEN
1 COAT CUTBACK AIR-BLOWN ASPHALT WITH 5% ASBESTOS 4.2 LBS/SQ YD AT 87 FT., FINAL CURE 12 HRS AT 140°F IN AIR CIRCULATING OVEN
0 10 20 30 40 50 60
TIME (HOURS)
NOTES:
(1) ⅝ — INDICATES NO FAILURE (TEST TERMINATED)
(2) ALL SAMPLES WERE ON 5.0Z/SQ YD FABRIC
(3) SIMULATED DEPTH BY APPLIED PRESSURE IN A TEST APPARATUS

1. A method of providing a surface covering comprising a non-woven polyolefin fabric, mat or web, fused externally on one side and having unfused fiber on the other external side, which method comprises placing said polyolefin fabric, mat or web, which can be needle-punched, against a surface to be rendered impervious to fluids, the side of the fabric placed against the surface to be covered having been fused and then coating the other side of the fabric which presents unfused fibers with a mixture containing asphalt and asbestos fibers.

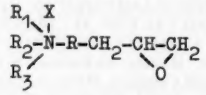
3,864,158

RECORDING MATERIAL

Daniel Maurice Timmerman, Mortsel, and Walter Frans De Winter, Berchem, both of Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium

Filed Jan. 15, 1973, Ser. No. 323,420
Claims priority, application Great Britain, Jan. 17, 1972, 2134/72
Int. Cl. B32b *27/00*; **H01b** *1/06*
U.S. Cl. 117—201 **4 Claims**

1. A recording material comprising a support of paper or synthetic polymer, an electroconductive layer coated on at least one side of said support, said electroconductive layer having a surface resistance measured at 15 percent of relative humidity lower than 10^{11} ohm/sq., said electroconductive layer consisting of or including a major proportion of a water-soluble polymer resulting from the amino-alkylation of polyethyleneimine with an epoxy compound bearing a quaternary ammonium end group, according to the general formula:



wherein:
R represents a branched or unbranched alkylene group having up to 4 carbon atoms,
each of R_1, R_2, and R_3 (same or different) represents an alkyl group containing up to 4 carbon atoms, a cycloalkyl group or an aralkyl group,
or wherein R_1, R_2, and R_3 together with the nitrogen atom represent a heterocyclic amine group, and
X is an anion.

3,864,159

CAPACITOR HAVING THICK-FILM GLASS-CERAMIC DIELECTRIC LAYER AND METHOD FOR MANUFACTURE

Marshall Field, Luckey, and James E. Rapp, Oregon, both of Ohio, assignors to Owens-Illinois Inc., Toledo, Ohio

Filed Dec. 4, 1972, Ser. No. 311,854
Int. Cl. H01g *1/00*; **H01b** *3/02*; **B44d** *1/18*
U.S. Cl. 117—212 **8 Claims**

1. In the method for forming a capacitor having a thick-film, glass-ceramic, dielectric layer positioned between an electrode and a counterelectrode, wherein a mixture of a thermally crystallizable glass frit and a binder is deposited in a predetermined pattern on said electrode, and the mixture is maintained at a temperature and for a time sufficient to expel said binder, fuse and crystallize said crystallizable glass frit to form said dielectric layer, the improvement for forming a capacitor having a dielectric constant of at least about 90 at 5KHz, a dissipation factor of less than about 3% at 5KHz and a temperature coefficient of capacitance of ±15% over the range of −25°C. to 125°C. wherein said thermally crystallizable glass frit consists essentially of:

INGREDIENTS	Mole %
GeO_2	20–36
Nb_2O_5	32–40
Na_2O	32–40

wherein the molar ratio of Na_2O to Nb_2O_5 is from about 0.8:1 to about 1.2:1, wherein up to one-half of the GeO_2 is replaced with B_2O_3 on a molar basis; wherein up to one-half of the Na_2O is replaced with K_2O on a molar basis; and CdO is present in proportions up to about 5 mole % of the frit composition as molar replacement for Na_2O and K_2O; but when GeO_2 content is less than 24%, the B_2O_3 content is at least about 5%, or the CdO content is at least about 1%.

3,864,160

METAL-CONTAINING FIBROUS MATERIAL

Charles Davidoff, 118 Rolling Hill Rd., Manhasset, N.Y. 11030

Continuation of Ser. No. 28,912, April 15, 1970, abandoned. This application Mar. 23, 1973, Ser. No. 344,156
Int. Cl. B44d *1/18*; **H01c** *7/00*, *3/00*
U.S. Cl. 117—212 **7 Claims**

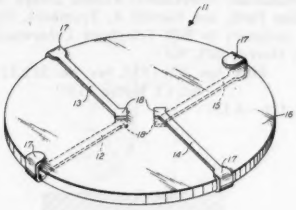
1. A flexible fabric woven with yarns composed of electrically non-conductive and magnetically non-responsive continuous filaments, said fabric having discrete areas of patterns extending from one surface to the corresponding opposite surface of the fabric, all the surfaces of the filaments within such areas or patterns being individually coated with a flexible substantially uniform and continuous about 1×10^{-6} to 40×10^{-6} inch thick film of electrically conductive or magnetically responsive metal, whereby such areas or patterns have electrical resistive values of about 0.01 to 500 ohms per square the lines of demarcation separating such areas or patterns from remaining unmetallized portions of said fabric crossing filaments whereby the segments of the crossed filaments within such areas or patterns are coated with said film and segments of the same crossed filaments outside such areas or patterns are not so coated, the filaments in both the metallized areas or patterns and unmetallized portions being substantially uniformly flexible and unattached to, and free to move relative to, filaments adjacent thereto.

3,864,161

METHOD AND APPARATUS FOR ADJUSTING RESONATORS FORMED ON A PIEZOELECTRIC WAFER

Edwin C. Thompson, Epping, N.H., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Aug. 10, 1973, Ser. No. 387,580
Int. Cl. B44d *1/18*
U.S. Cl. 117—212 12 Claims



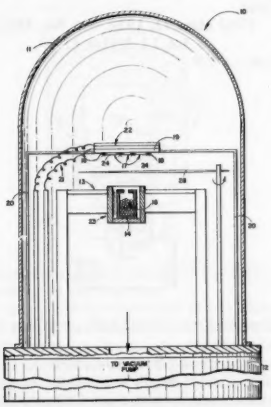
1. A method for adjusting the resonant frequency of a resonator, formed on a piezoelectric wafer, to a predetermined resonant frequency, said method comprising the steps of:
pliantly contacting a major surface of the wafer with a pliant mask having an aperture therein to expose a selectedd portion of the resonator;
depositing material on the selected portion of the resonator through the mask to adjust the resonant frequency of the resonator;
testing the resonator by exciting and monitoring the resonant frequency thereof as material is deposited on the selected portion; and
stopping the deposition of material on the selected portion when the resonant frequency reaches a predetermined value.

3,864,162

METHOD OF FORMING GALLIUM ARSENIDE FILMS BY VACUUM EVAPORATION DEPOSITION

Joseph L. Kenty, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 4, 1975, Ser. No. 379,521
Int. Cl. C23c *13/04*
U.S. Cl. 117—213 10 Claims



1. A method of forming a layer of monocrystalline gallium arsenide on a monocrystalline substrate having a dissimilar crystal structure, comprising:
removing a sufficient thickness of substrate mateial from at least one surface of the substrate to define a substantially smooth surface;
etching said surface to define a clean surface finish;
heating a single source of gallium arsenide at a subatmospheric pressure of approximately 10^{-5} to 10^{-8} torr to evaporate gallium and arsenic; and
heating the substrate at the subatmospheric pressure to a temperature sufficient to condense stoichiometric gallium arsenide on said one surface of said substrate.

3,864,163

METHOD OF MAKING AN ELECTRODE HAVING A COATING CONTAINING A PLATINUM METAL OXIDE THEREON

Henri Bernard Beer, Kalmthout, Belgium, assignor to Chemnor Corporation, Panama City, Panama

Division of Ser. No. 75,726, Sept. 25, 1970, Pat. No. 3,711,385, which is a continuation-in-part of Ser. No. 549,194, May 11, 1966, abandoned. This application Mar. 24, 1972, Ser. No. 237,969
Int. Cl. B44d *1/02*; B01k *3/04*
U.S. Cl. 117—217 45 Claims

1. A method of making an electrode comprising forming on at least part of the surface of a core of a film-forming metal a layer containing at least one platinum metal taken from the group consisting of platinum, iridium, rhodium, palladium, ruthenium, rhenium and osmium, and alloys of these metals, the amount of platinum metal being sufficient, when converted to the oxide thereof, to be effective for carrying out electrolysis, and subjecting the layer to oxidizing conditions which are sufficient to oxidize the metal of said layer until the layer is oxidized to a depth of at least about 0.054 micron.

22. A method as claimed in claim **21** in which the step of applying the material comprises spraying the dispersion onto the core.

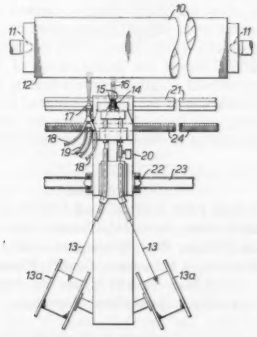
45. A method as claimed in claim **43** in which the core is titanium and the platinum metal is platinum and the metal other than platinum metal is chromium.

3,864,164

METHOD FOR DEPOSITING PROTECTIVE COATINGS ON CARBON ARTICLES

Alan Hinchcliffe, Sheffield, and Kenneth Johnson, Doncaster, both of England, assignors to British Steel Corporation, London, England

Filed Oct. 20, 1972, Ser. No. 299,455
Claims priority, application Great Britain, Oct. 22, 1971, 49261/71
Int. Cl. B44d *1/08*, *1/16*; C23c *7/00*
U.S. Cl. 117—217 9 Claims



1. A method of creating a protective coating on the surface of a carbon article comprising, in a single operation, directing

a spray of aluminium in molten state against said surface, and immediately thereafter directing a spray of a water-slurry of refractory material onto the aluminium coating so formed without drying out said slurry before it reaches the surface of said carbon article, there being substantially no interference between the sprays.

3,864,165

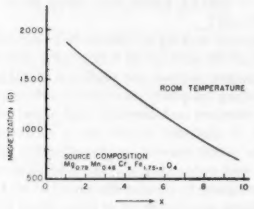
FABRICATION OF FERRITE FILM FOR MICROWAVE APPLICATIONS

Aleksander I. Braginski, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 069,658, Sept. 8, 1970, abandoned, which is a continuation-in-part of Ser. No. 867,699, Oct. 20, 1969, abandoned, and a continuation-in-part of Ser. No. 814,709, April 9, 1969, abandoned. This application Jan. 2, 1973, Ser. No. 320,250

Int. Cl. C23c *11/08*; **H01f** *41/14*

U.S. Cl. 117—235 **16 Claims**



1. In the chemical transport deposition method of producing on a substrate polycrystalline films of spinel ferrites having a thickness of less than about 1500 microns and which are suitable for use in microwave applications, the steps comprising:

assemblying in a reactor a multicomponent source material of a spinel ferrite selected from the group consisting of magnesium ferrites, manganese-magnesium ferrites, and transitional metal ferrites and a substrate material in spaced relation to one another, the substrate material being suitable for use in a microwave application,

flowing a carrier gas and a reaction gas through the reactor in contact with said source material and said substrate material said carrier gas being selected from the group consisting of inert gases and oxygen and mixtures thereof and said reaction gas being selected from the group consisting of the halogens and halogen hydrides, heating the materials in the reactor with a single heat source to a temperature sufficiently high to cause a reaction between the source material and the reaction gas, maintaining the substrate at a temperature within the range between 20°C and 200°C below the temperature of the source for a predetermined length of time whereby a film of the desired thickness of the source material is deposited on the substrate and thereafter cooling the substrate with the deposited film thereon to room temperature.

3,864,166

PROCESS FOR THE SEPARATION OF SUGARS

Sidney Alan Barker; Peter John Somers, both of Birmingham, and Brian William Hatt, Bromsgrove, all of England, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed May 30, 1973, Ser. No. 365,360

Claims priority, application Germany, June 5, 1972, 2229208

Int. Cl. C13d *3/12*; **C13k** *9/00*

U.S. Cl. 127—46 R **9 Claims**

1. Process for the separation of mixtures of sugars and of sugar alcohols comprising subjecting an aqueous solution thereof to chromatography on an insoluble organic resin, wherein the resin used is an aryl boric acid group-containing resin, and recovering the component sugars or sugar alcohols obtained.

3,864,167

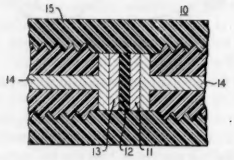
NON-AQUEOUS BATTERY USING CHALCOGENIDE ELECTRODE

John Broadhead, Morristown; Francis Joseph Di Salvo, Jr., Florham Park, and Forrest A. Trumbore, Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 19, 1973, Ser. No. 352,514

Int. Cl. H01m *35/02*

U.S. Cl. 136—6 LN **7 Claims**



1. A non-aqueous secondary power supply comprising at least one cell, said cell comprising an electrolyte, negative electrode with active negative electrode material and positive electrode with active positive electrode material, characterized in that the said active positive electrode material consists essentially of a transition-metal chalcogenide selected from the group consisting of niobium triselenide, tantalum trisulfide, titanium trisulfide, niobium trisulfide, and tantalum triselenide and said active positive electrode material has a fibrous structure which persists in both charged and discharged state in which the fibers are at least 1 micron in length and have aspect ratios from 5:1 to 1000:1.

3,864,168

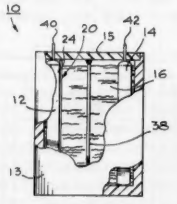
ELECTROLYTIC CELLS INCORPORATING WATER SCAVENGERS

John E. Casey, Jr., and Roland F. Chireau, both of Stonington, Conn., assignors to Yardney International Corp., Los Angeles, Calif.

Filed Mar. 22, 1974, Ser. No. 453,589

Int. Cl. H01m *43/00*

U.S. Cl. 136—6 LN **19 Claims**



1. An improved electrolytic cell comprising in combination:

a. A metallic anode;

b. A cathode spaced from said anode;

c. An organic substantially water-free electrolyte containing a dissolved salt current carrier disposed between and in contact with both of said electrodes, and

d. A particulate solid water scavenger disposed in association with at least one of said electrodes and said electrolyte.

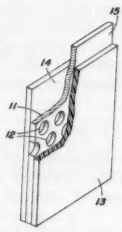
3,864,169
METHOD FOR MAKING LAMINATED ELECTRODES

John P. Cestaro, Trenton, and Uriel Sokolov, Princeton, both of N.J., assignors to N L Industries, Inc., New York, N.Y.

Division of Ser. No. 330,316, Feb. 13, 1973, which is a continuation-in-part of Ser. No. 151,935, May 10, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,163

Int. Cl. H01m *35/18*

U.S. Cl. 136—75 8 Claims



1. A method for making a composite sheet of a loose homogeneous mat of synthetic fibers coated with a powdered active material said composite sheet useful for forming a laminated electrode which comprises dispersing synthetic fibers in water with agitation to form a slurry, adding powdered active material to said slurry and after thoroughly mixing, flocculating the dispersed slurry by lowering the pH until a large flocculated mass of fibers and active material is formed, filtering and drying said flocculated mass to form a composite sheet of a loose homogeneous mat of fibers coated with said active material.

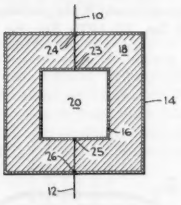
3,864,170
LOW CONDUCTIVITY THERMAL INSULATOR FOR THERMAL BATTERIES

Frank C. Krieger, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 249,583, May 2, 1972, abandoned. This application Apr. 18, 1974, Ser. No. 462,056

Int. Cl. H01m *21/14*

U.S. Cl. 136—83 T 14 Claims



1. A low thermal conductive insulator for thermal power supplies, comprising, in combination:

a. a thermal battery having electrodes and at least one solid electrically non-conducting material at normal storage temperature but becoming an electrolyte in the molten state and means contained in the battery for supplying heat to melt said electrolyte causing said cell to become functionally active to produce electric current, said means also causing high thermally conductive gases to be evolved and capable of reducing the efficiency of a porous thermal insulator said battery being in a gas tight metal container;

b. a porous thermal insulator surrounding said thermal battery to reduce heat losses therefrom; and

c. at least one low thermal conductive inert gas located within the pores of said insulator for further reducing the heat losses from said thermal battery, said gas having a thermal conductivity below that of air, and not liquefied at normal operating temperatures of said thermal battery.

10. A method of reducing the thermal conductivity in the porous thermal insulation that surrounds the active components of a thermal battery, comprising the steps of:

a. placing a gas tight metal container between said active components of said thermal battery and said thermal insulation to reduce the amount of high thermally conductive contaminants entering said insulation; and

b. introducing an effective amount of low thermal conductivity inert gas having a thermal conductivity below that of air into the pores of said thermal insulation to reduce the effect of any high thermally conductive gases not excluded by step (a).

3,864,171
ELECTROCHEMICAL CELLS

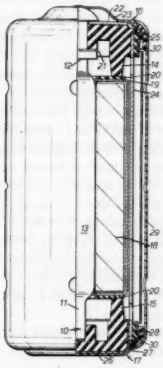
Terence Mills, Basingstoke; Marian Wiacek, Baughurst; Peter James Gillespie, Basingstoke, and Clive Douglas Hatcher, Reading, all of England, assignors to Energy Conversion Limited, Basingstoke, Hampshire, England

Filed Aug. 22, 1972, Ser. No. 282,696

Claims priority, application Great Britain, Sept. 14, 1971, 42705/71

Int. Cl. H01m *21/00*

U.S. Cl. 136—107 11 Claims



1. A gas depolarized cell comprising:

a. a tubular apertured anode electrode;

b. a separator extending around and adjacent the outer surface of said apertured anode electrode;

c. a tubular cathode electrode adjacent the outer surface of the separator and extending beyond said apertured anode electrode at each end thereof to an associated end cap;

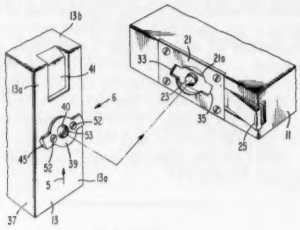
d. electrolyte at least contained within the separator;

e. a current collector which passes through said apertured anode electrode longitudinally and extends beyond each end thereof to said associated end cap, said current collector being electrically connected to said apertured anode electrode and being located between and in operative contact with the end caps in the form of a strut whereby longitudinally rigidity is imparted to the cell.

3,864,172
BATTERY CONNECTING ASSEMBLY

Richard Earl Marks, Houston, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 17, 1973, Ser. No. 361,305
Int. Cl. H01m *1/02*
U.S. Cl. 136—173 **3 Claims**



1. In combination, an electrical device, a supporting plate having a large opening therein and a pair of smaller notches at opposite sides of said large opening, said plate being mounted across a recess in the body of said device located along a first wall thereof, a first electrically conductive contactor extending into said recess and centered with respect to said large opening and coupled to circuitry within said electrical device,

a battery case adapted to hold at least one battery therein, said case including at one end a protruding member extending from one wall of said battery case and having a pair of radially extending lugs, said protruding member having an aperture in the center thereof, a second electrically conductive contactor extending in insulative manner from a terminal of said battery into said aperture in said protruding member, said protruding member and said lugs being adapted to be inserted into said large opening in said plate by passing the pair of lugs through said pair of notches in said plate whereby to dispose said lugs at the side of said plate opposite the plate side adjacent said one wall of said battery case, said lugs including a generally symmetrically shaped camming portion having a peak extending toward said one wall of said battery case with the peak of the camming portion arranged such that after the protruding member is given a partial rotation in either direction from the position thereof in which said lugs are in said notches said plate is clamped between the peak of the camming portions and said one wall of the battery case and said first and second contactors make electrical contact, and

means for releasably latching said battery case from rotation when clamped to said plate.

3,864,173
ELECTRIC BATTERY PROVIDED WITH A SAFEGUARD AGAINST SHORT-CIRCUITINGS

Hans Butschkau, Franz-Lenze-Platz 37a, 4103 Walsum, Germany

Filed Apr. 18, 1973, Ser. No. 352,307
Int. Cl. H01m *31/00*
U.S. Cl. 136—181 **8 Claims**

1. A short-circuiting protection arrangement for an electrical battery, comprising, in combination:

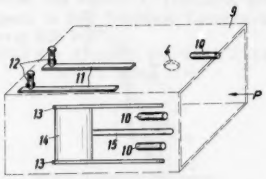
a. an electrical battery;

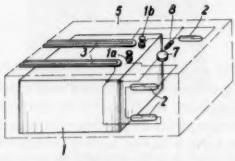
b. inner housing means for housing the battery;

c. a normally-open magnetically switchable switch arranged in the inner housing means and electrically connectable to the battery;

d. outer housing means for housing the inner housing means, the inner housing means being insertable into the outer housing means;

e. a magnet having an associated magnetic field and arranged on the outer housing means for being operatively associated with the switch and closing same when the inner housing means is inserted into the outer housing means;





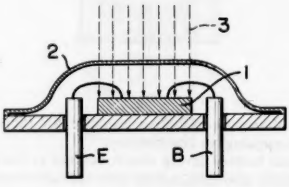
f. terminals mounted on the outer housing means; and

g. contact means provided on the inner housing means and outer housing means for connecting the switch to the terminals when the inner housing means is inserted into the outer housing means.

3,864,174
METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

Nobuyuki Akiyama, No. 2612, Shinomiya, Hiratsuka-shi, Kanagawa-ken; Shunji Miura, No. 18-1, Takada 1-chome, Toshima-ku, Tokyo, and Haruo Chisaka, No. 25-5, Misono 3-chome, Sagamihara-shi Kanagawa-ken, all of Japan

Filed Jan. 22, 1973, Ser. No. 325,745
Int. Cl. H01l *7/54*
U.S. Cl. 148—1.5 **3 Claims**



1. A method for manufacturing semiconductor device characterized in that a semiconductor element is fabricated, lifetime killers are introduced into the element by diffusion or like, and the element is thereafter subjected to an irradiation of electrons of an energy ranging from 0.1 to 5.0 Mev.

3,864,175

CHROMATE RINSE FOR PHOSPHATE COATED METALS AND METAL PRODUCTS

Kurt Goltz, Exton, and Willaim Adrian Blum, Fort Washington, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 25, 1973, Ser. No. 354,401
Int. Cl. C23c *1/10*; C23f *7/24*
U.S. Cl. 148—6.2 17 Claims

1. The process of sealing a phosphate coated metal comprising wetting the phosphate coated metal by contacting it with an acidic aqueous solution consisting essentially of aluminum chromate polymer in which solution the concentration of the aluminum chromate polymer is at least 0.1 grams per liter expressed as CrO_3, rinsing the wetted metal with deionized water and then drying the said metal.

3,864,176

MOULDING OF SUPERPLASTIC ALLOY SHEET

Colin John Swanson, Horfield, England, assignor to ISC Alloys Limited, London, England

Filed June 14, 1973, Ser. No. 370,035
Claims priority, application Great Britain, June 14, 1972, 27891/72
Int. Cl. C21d *9/48*; C22f *1/04*
U.S. Cl. 148—11.5 R 9 Claims

1. In a method of moulding superplastic zinc/aluminium alloy sheet material containing from 15 to 40 percent by weight of aluminium comprising heating a blank of the sheet material to a temperature at which the material exhibits superplasticity, moulding the heated blank to conform to a mould surface of desired shape, and removing the moulded sheet from the mould, the improvement comprising holding the moulded sheet at a temperature of from 180° to 220°C to remove undesired warping or distortions from the moulded sheet.

3,864,177

SAFE-HANDLING PERCHLORATE EXPLOSIVES

Maximilian Klunsch, Opladen; Paul Lingens, Leverkusen, and Heinz Ratz, Bonn-Ippendorf, all of Germany, assignors to Dynamit Nobel Aktiengellschaft, Troisdorf, Germany

Filed May 26, 1972, Ser. No. 258,850
Claims priority, application Germany, May 29, 1971, 2126920
Int. Cl. C06b *11/00*
U.S. Cl. 149—36 23 Claims

1. An explosive composition containing an explosive salt of perchloric acid which is sensitive to impact and shock and a solvent therefor, which solvent has a boiling point above 150°C, said explosive salt of perchloric acid being dissolved in said solvent, said composition being such that the ingredients are present in such amount so that the solvent at −20°C contains said explosive salt in dissolved liquid form, said composition exploding when detonated.

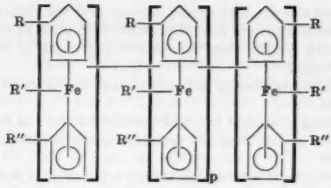
3,864,178

LIQUID POLYNUCLEAR HYDROCARBYL FERROCENES

Thomas P. Rudy, Saratoga, and Harry J. Hyer, Palo Alto, both of Calif., assignors to United Aircraft Corporation, East Hartford, Conn.

Continuation-in-part of Ser. No. 663,517, Aug. 28, 1967, abandoned. This application Mar. 29, 1968, Ser. No. 718,313
Int. Cl. C07f *15/02*; C06b *19/00*
U.S. Cl. 149—109.4 18 Claims

1. A noncrystalline, noncrystallizable liquid composition of matter comprising a mixture of polynuclear ferrocene derivatives having the general formula:



wherein R is a lower alkyl group, R′ and R″ are selected from the group consisting of hydrogen and lower alkyl groups, the total number of carbon atoms in R, R′ and R″ being from 1 – 6 and p is an integer from 0 – 1.

3,864,179

PRODUCTION OF METAL PATTERN CONTAINING FABRIC

Charles Davidoff, 118 Rolling Hill Rd., Manhasset, N.Y. 11030

Division of Ser. No. 28,912, April 15, 1970, abandoned. This application Mar. 23, 1973, Ser. No. 344,157
Int. Cl. C23f *1/00*
U.S. Cl. 156—3 10 Claims

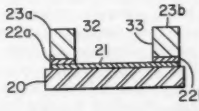
1. A method comprising treating a flexible fabric woven with yarns composed of electrically non-conductive and magnetically non-responsive continuous filaments individually coated with a flexible, substantially uniform and continuous about 1×10^{-6} to 40×10^{-6} inch thick film of electrically conductive or magnetically responsive metal to remove the metal film coating from all the filaments in only certain portions of one surface through to the corresponding opposite surface of the fabric by treating said certain portions with a solvent for said metal film coating.

3,864,180

PROCESS FOR FORMING THIN-FILM CIRCUIT DEVICES

William D. Barraclough, Simi Valley, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Continuation of Ser. No. 165,628, July 23, 1971, abandoned. This application June 29, 1973, Ser. No. 374,846
Int. Cl. B32b *31/14*; C23f *1/02*
U.S. Cl. 156—3 7 Claims



1. A process for forming a thin-flim circuit device containing a circuit element and contacts comprising the steps of:

providing a laminated structure including a substrate having thereon a thin-film layer of material having electrical characteristics corresponding to those of the intended circuit element, the thin-film layer being covered by a first layer of conductive material until the desired bounds of the circuit element and contacts have been formed, and the first layer being covered by a second layer of conductive material;

applying a first layer of a photoresist over said second layer;

forming an image on said first layer of photoresist which defines predetermined dimensions between intended contacts;

developing said first layer of photoresist to form an aperture therein;

selectively etching a rectangular cavity through said second layer to expose a surface of saio first layer, the dimension between a first pair of opposite side walls of said cavity being the same as the dimension between the intended

contacts for said circuit device, and the dimension between a second pair of opposite side walls of said cavity being greater than the dimensional width of the circuit element;

removing remaining portions of said first layer of photoresist;

applying a second layer of photoresist over exposed portions of said first and second layers of conductive material;

forming an image on said second layer of photoresist which defines the desired bounds of the circuit device;

developing said second layer of photoresist, said developed second layer having a dimensional width less than said dimension between said second pair of opposite side walls and equal to the dimensional width of the circuit element;

subsequently selectively etching portions of said first, second and thin-film layers with first, second and third etchants respectively to leave portions of said first, second and thin-film layers coincident with the configuration of the desired bounds of the circuit device, each said layer being attacked by only its respective etchant, the remaining portions of said second layer forming a plurality of individual contacts;

removing remaining portions of said second layer of photoresist; and

subsequently selectively etching the exposed surface of said first layer to expose a surface of said thin-film layer between contacts formed of the remaining portions of said conductive layer.

3,864,181

POLYMER FOAM COMPOSITIONS

Leon E. Wolinski, Cheektowaga, and Arthur R. Endress, Hamburg, both of N.Y., assignors to Pratt & Lambert, Inc., Buffalo, N.Y.

Division of Ser. No. 259,656, June 5, 1972, , which is a continuation-in-part of Ser. No. 122,086, March 8, 1971, abandoned. This application Mar. 19, 1973, Ser. No. 342,744

Int. Cl. B32B *31/14*

U.S. Cl. 156—79 **20 Claims**

1. A method of making a shock absorbing package comprising forming a coating composition of a solution of a film-forming polymer in a solvent therefor, having dispersed in said solution about 0.25 to 45.0 weight percent, based on the weight of said film-forming polymer, of thermally expandable thermoplastic microspheres, applying said coating composition to a paper based substrate, drying the coated substrate to remove the solvent from the coating composition, cutting and creasing the coated substrate to form a package blank, wherein said blank includes edges to be overlapped, applying to the edges to be overlapped an adhesive, folding said blank to form a package, adhesively bonding the overlapping edges, and heating to expand the microspheres.

3,864,182

METHOD OF MAKING A REINFORCED PLASTIC APERTURED TUBE

Samuel M. Shobert, Mishawaka, and Bernard L. Rice, Osceola, both of Ind., assignors to Plas/Steel Products, Inc., Walkton, Ind.

Filed July 18, 1973, Ser. No. 380,489

Int. Cl. B31c *13/00;* **E03b** *3/18*

U.S. Cl. 156—175 **11 Claims**

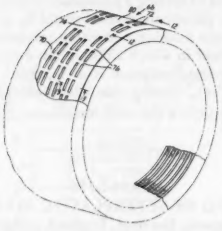
1. The method of fabricating an apertured tube comprising the steps of:

a. providing an elongated flexible strip proportioned and arranged to be wound on a mandrel, said strip having a base portion with an upstanding portion extending therefrom,

b. winding said strip on a mandrel with said base portion in engagement therewith and said upstanding portion forming a generally helical groove,

c. forming circumferentially spaced, longitudinally extending grooves in said upstanding portion of the thus-wound strip,

d. winding multi-filament glass strands pre-wetted with hardenable plastic material in said helical groove and placing lengths of such strand in said longitudinal grooves so as substantially to fill said helical and longitudinal grooves,



e. hardening said plastic material while said strands and lengths are in said grooves and said strip is on said mandrel thereby to form a glass-fiber reinforced plastic tube surrounding said base portion of said strip and with said upstanding portion embedded in the wall of said tube,

f. removing said mandrel from the interior of said base portion of the wound strip, and

g. removing said strip from the interior of said tube, removal of said upstanding portion from the wall of said tube leaving apertures therein.

3,864,183

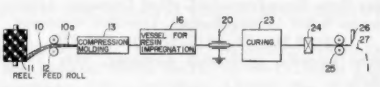
METHOD FOR PRODUCING PEN CORE FROM FILAMENT TOWS

Hironobu Hori, Tokyo, Japan, assignor to Tokyo Boshi Kabushiki Kaisha, Tokyo-To, Japan

Filed Nov. 21, 1972, Ser. No. 308,456

Int. Cl. D02j *1/00;* **B43k** *15/00*

U.S. Cl. 156—180 **8 Claims**



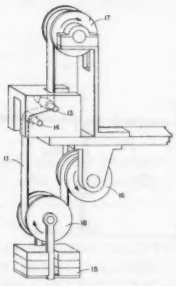
1. In a method for producing pen cores from a synthetic fiber bundle, comprising the steps of subjecting a tow of synthetic fibers to compression-molding under heat to form a rod-shaped body having a predetermined cross-sectional shape, immersing said compression-molded, rod-shaped body in a liquid containing a synthetic resin and solvent therefore to impregnate the liquid into the body, subjecting said liquid impregnated rod-shaped body to a dielectric heating treatment in a high frequency electric field of an intensity sufficient to cause internal heating within the rod-shaped body to volatilize the solvent in said liquid, in a state wherein the rod-shaped body is passed through a pipe of low dielectric constant which shields the body from the external atmosphere, cutting the thus treated rod-shaped body into a required length, and shaping at least one end of the rod-shaped body to taper said end into a configuration required for a writing tip, the improvement wherein said liquid is prepared by dissolving a synthetic resin in a solvent consisting essentially of a principal solvent and a polar solvent having a high dielectric constant, a lower volatilization speed than that of said principal solvent and a higher boiling point than that of said principal solvent, said polar solvent being used as a heating medium and for generating internal heat due to dielectric loss therein

during said dielectric heating treatment, to volatilize the principal solvent and to heat the rod-shaped body internally, thereby gelling the synthetic resin.

3,864,184
TECHNIQUE FOR FORMING LAMINATED FILAMENTARY COMPOSITES UTILIZING PRESTRESSING

Walter E. Crandall, Malibu; George J. Mills, Santa Ana, and Gary G. Brown, Diamond Bar, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Continuation of Ser. No. 195,590, Nov. 4, 1971, abandoned. This application Aug. 22, 1973, Ser. No. 390,595
Int. Cl. B32b *31/16*
U.S. Cl. 156—180 **15 Claims**



1. A technique for fabricating fibered laminated composites from a plurality of sections formed of similar type of load bearing filaments impreganted with a matrix material comprising the steps of:

stressing each of said sections until a number of the filaments thereof are broken,

layering said sections against each other, and

molding said layered sections into a laminated composite.

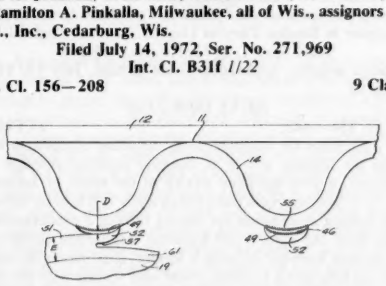
9. A technique for fabricating sections formed of similarly type of load bearing filaments impregnated with a matrix material for use in making a laminated composite formed from a plurality of such sections layered against each other and molded together comprising:

stressing each of said sections and all of the filaments thereof uniformly with a predetermined force such as to break a number of the weaker filaments and to leave the stronger filaments unbroken.

3,864,185
METHOD OF MAKING CORRUGATED PAPERBOARD

Paul A. Johnson, West Allis; David Adams, West Bend, and Hamilton A. Pinkalla, Milwaukee, all of Wis., assignors to I. D., Inc., Cedarburg, Wis.

Filed July 14, 1972, Ser. No. 271,969
Int. Cl. B31f *1/22*
U.S. Cl. 156—208 **9 Claims**

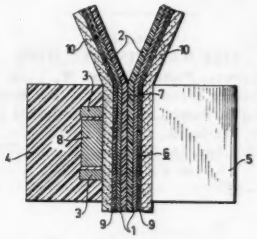


1. In a method of manufacture of double-faced corrugated paperboard, the improvement comprising the steps of applying a coating of gel point depressant to the exposed flute tips of the corrugated medium faced with a single liner opposite the exposed flute tips by contact of an applicator carrying the depressant with the flute tips, applying an adhesive over the coated flute tips with an adhesive roller and wherein the coating of adhesive on said roller is substantially thicker than the coating of gel point depressant on the flute tips to cause a splitting of the adhesive coating on the roller into an adhesive layer on the flute tips and an adhesive layer on the adhesive roller which isolates the depressant coating from the adhesive roller and the coating of adhesive film on the adhesive roller, initiating gelatinization of the adhesive starting from the interface of the adhesive and gel point depressant outwardly through the adhesive coating, and applying an additional board layer to the coated flute tips prior to material gelatinization of the outer exposed surface of the adhesive.

3,864,186
METHOD FOR INDUCTION SEALING PACKAGING MATERIAL

Gyula Balla, Malmo, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Continuation of Ser. No. 95,150, Dec. 4, 1970, abandoned. This application Jan. 12, 1973, Ser. No. 323,095
Claims priority, application Sweden, Dec. 10, 1969, 17018/69
Int. Cl. B29c *19/02*; **B32b** *31/00*
U.S. Cl. 156—272 **5 Claims**



1. A method of producing separate packages from a continuous tube having an inner layer of thermoplastic material and a layer of metal foil disposed on the outside thereof by forming simultaneously, two longitudinally spaced, adjacent, transverse seals across the tube comprising,

pressing opposed portions of the tube together along a transverse area so that the layers of thermoplstic material of each portion are flattened together and are juxtaposed, inducing simultaneously a flow of two sets of spaced, adjacent, heat-producing eddy currents in the layers of the metal foil to heat said metal layers to a temperature sufficient to heat said thermoplastic material, by conduction, to fusion temperatures at two longidudinally spaced, parallel, adjacent, transverse zones in said transverse area to thereby form simultaneously two tight, mechanically durable, parallel, longitudinally spaced, adjacent, transverse seals, across the tube and,

cutting the tube transversely between the two, adjacent seals to separate the continuous tube into separate packages.

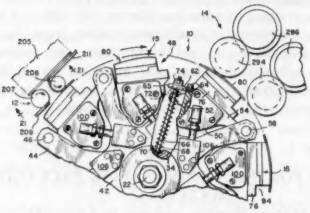
3,864,187
LABELING MACHINE

Sidney T. Carter, Shrewsbury, Mass., assignor to A-T-O Inc., Cleveland, Ohio

Filed Mar. 29, 1973, Ser. No. 346,125
Int. Cl. B65c *9/08*
U.S. Cl. 156—364 **33 Claims**

1. In a label applying machine, rotary transfer means comprising a rotor rotatable about a predetermined axis, a picker,

adhesive applying means, and container supporting means supported about said rotor, label holding pads mounted on the rotor for movement from a normally distended position in which they travel in a path tangent to the picker, adhesive applying means and container supporting means to a retracted position withdrawn from said path of tangency, means for yieldably holding the label holding pads distended and means



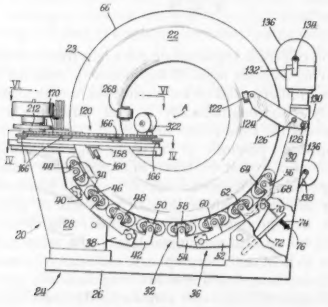
operable as the pads travel from the picker toward the adhesive applying means in the absence of labels on the pads to withdraw the pads from the path of tangency with the adhesive applying means, said means being rendered inoperative as the pads travel away from the place of application of the labels to the containers to restore the pads to their distended positions before they reach the picker.

3,864,188

TIRE WRAPPING MACHINE

Charles E. Grawey, Peoria; Robert W. Untz, Hanna City; Ronald L. Satzler, Metamora; Jesse R. Berchtold, Pekin, and Floyd S. Dadds, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 16, 1973, Ser. No. 351,779
Int. Cl. B29h *17/02*
U.S. Cl. 156—397 **53 Claims**



1. Apparatus for winding flexible elongated material about the body of a toroidal member comprising:

a base;

roller means associated with the base for supporting the toroidal member, the toroidal member being rollable about its axis on said roller means;

guide means for guiding the elongated material onto the surface of the toroidal member;

means for rotating the guide means about the body of the toroidal member to deposit the elongated material on the surface of the toroidal member;

means for providing relative motion between the guide means and the toroidal member about the axis of the toroidal member, whereby the elongated material is wound about the toroidal member, and

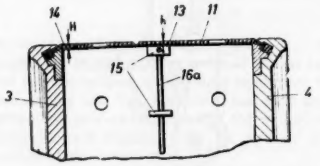
means interconnecting the base and roller means for providing continuous positive support of the toroidal member by the roller means while compensating for changing size of the toroidal member due to the winding of the elongated material thereon.

3,864,189

BUILDING OF PNEUMATIC TIRE ASSEMBLIES

Hans Galleithner, Baden, and Kurt Strauch, Wien, both of Austria, assignors to Semperit Aktiengesellschaft, Vienna, Austria

Filed Feb. 22, 1972, Ser. No. 227,787
Claims priority, application Austria, Feb. 22, 1971, 1473/71
Int. Cl. B29h *17/16*
U.S. Cl. 156—415 **12 Claims**



1. A building drum for fabricating a radial belted, pneumatic tire assembly comprising the combination of two parallel discs which are adapted to be moved coaxially with respect to one another, a flexible, fluid permeable support element mounted on said discs to define an annular chamber for receiving thereon a partial tire assembly including bead cores and a carcass, means for supplying a pressurized fluid to the interior of said annular chamber and means for deflecting said support element radially inward, whereby the partial tire assembly is deflected radially outward when the pressurized fluid passes through said support element to thereby act directly on the interior surface of the partial tire assembly and further including means comprising a plurality of retaining members secured to the interior surface of said support element and at least one prestressed, annular spring member threaded through said retaining members.

3,864,190

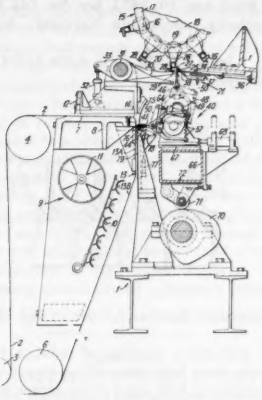
APPARATUS FOR MANUFACTURING CARPETING

Herbert Coates, Shelf near Halifax, Yorkshire, Great Britain, assignor to Bonded Carpets Limited, London, England

Filed Sept. 1, 1972, Ser. No. 285,565
Claims priority, application Great Britain, July 14, 1972, 32975/72
Int. Cl. D04h *11/00*
U.S. Cl. 156—443 **17 Claims**

1. Apparatus for manufacturing carpeting comprising feed means for feeding a web of backing material through the apparatus, a yarn selection device of the spool or Jacquard type for selecting a yarn from which a pile tuft is to be formed, a tuft cutting mechanism for cutting tufts of a predetermined length from the yarn, a tuft handling mechanism comprising a projecting member defining a former, cam means for bending a cut tuft into a U-shape about said former with the bent portion exposed and spaced from the web, said tuft handling mechanism including means to grip said tuft during tuft cutting by said cutting mechanism and during said bending of said tuft about said former, said tuft handling mechanism also

including means to move said projecting member with a tuft bent thereabout toward the backing material to present the



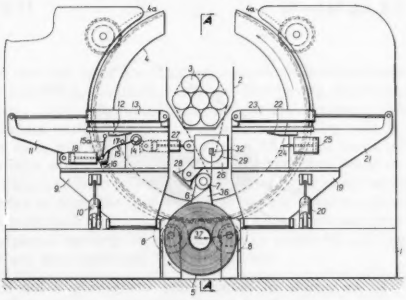
tufts to the backing material in a predetermined order, and means for bonding the tufts to the backing material.

3,864,191

ARRANGEMENT FOR BINDING TOGETHER PACKS OF ELONGATED OBJECTS SUCH AS RODS AND SIMILAR ARTICLES BY A SELF-STICKING BAND

Zdenek Tovarys, Ostrava, Czechoslovakia, assignor to Vitkovicke zelezarny Klementa Gottwalda narodni podnik, Ostrava, Czechoslovakia

Filed Feb. 5, 1973, Ser. No. 329,814
Int. Cl. B65b *13/10, 27/06*
U.S. Cl. 156—468 **2 Claims**



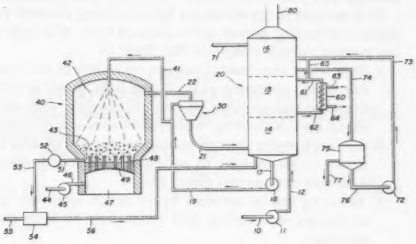
1. Apparatus for binding together packs of elongated objects such as rods, tubes and similar articles by a multiple bandage by means of a self sticking band comprising: a frame, a guiding trough for the elongated objects to be bound fixed on the frame, a carrier for the self sticking band encompassing the guiding trough, supported rotatably around a horizontal axis on the frame, a first pair of opposite gripper jaws for the self sticking band, a pair of arms pivotably supported on said frame, one of said arms on each side of the guiding trough, first power cylinders controlling the position of these pivotable arms, a slide slidingly guided on each of said pivotable arms, each of said slides supporting one of said gripper jaws, a second power cylinder on each of said pivotable arms controlling the position of said slide with respect to the pivotable arms, a third power cylinder pivotably supported on the slide of the first pivotable arm, the piston rod of this power cylinder pivotably connected with a suspension, a spring loaded lever with a finishing roller pivotably connected to the piston rod of this third power cylinder, a fourth power cylinder supported by the slide of the second pivotable arm, a cutting knife for the self sticking band controlled by the piston rod of this fourth cylinder, a gripper body for seizing the self sticking band suspended on the frame below the guiding trough, a fifth power cylinder controlling the position of this gripper body with respect to the frame, said gripper body housing a sixth power cylinder with a hollow piston rod and a second pair of gripper jaws for the self sticking band, the position of which with respect to the self sticking band is controlled by said sixth power cylinder, and a seventh power cylinder controlling the opening and closing of said second pair of gripper jaws.

3,864,192

APPARATUS FOR PRODUCING AMMONIA-BASE PULPING LIQUOR FROM SPENT LIQUOR

George G. Copeland, Western Springs, Ill., assignor to Copeland Systems Incorporated, Oakbrook, Ill.

Filed Dec. 20, 1971, Ser. No. 209,861
Int. Cl. B01d *1/16, 1/14*
U.S. Cl. 159—4 A **8 Claims**



1. Apparatus comprising:
a fluidized bed reactor having a bed of magnesia particles;
an exhaust gas conduit from the freeboard space of the reactor to a vessel for delivering magnesia fines, sulfur dioxide and other hot exhaust gases from the reactor to ammonia-base bisulfite spent liquor in the vessel;
a conduit for delivering ammonia-base bisulfite spent liquor to the vessel;
a conduit for delivering concentrated spent liquor from the vessel to the reactor for combustion of the liquor therein; and
means to absorb sulfur dioxide and ammonia from the vessel in aqueous ammonium hydroxide to form fresh ammonia-base bisulfite pulping liquor.

3,864,193

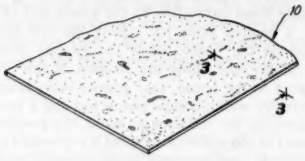
ELASTIC SHEET HAVING THE APPEARANCE OF STAINED GLASS

William Frierson, and Jerome Oberwager, both of Great Neck, N.Y., assignors to National Teaching Aids, Inc., Garden City Park, N.Y.

Filed Dec. 22, 1972, Ser. No. 317,748
Int. Cl. B44f *1/06*
U.S. Cl. 161—2 **7 Claims**

1. A vinyl plastic sheet having optical properties of stained glass, said sheet being an extruded plastic sheet obtained by extruding base vinyl plastic material containing therein partially melted particles having a higher melting temperature than the base material of the sheet, said particles representing

less than 2% of the total volume of the sheet and being dispersed therein such that there is a negligible number of areas



greater than one-fourth inch × one-fourth inch which exhibit a substantially uniform thickness, color and texture.

3,864,194

OPTICAL SHIELDING ELEMENT HAVING LOW REFLECTING POWER AND METHOD FOR PRODUCING

Takashi Shibata, and Teruo Kaneko, both of Tokyo, Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Nov. 21, 1973, Ser. No. 417,789

Claims priority, application Japan, Nov. 27, 1972, 47-118118

Int. Cl. B32b *17/06*

U.S. Cl. 161—6 **12 Claims**

1. A method for producing a light shielding element exhibiting low reflecting power with a desired form of a light shielding portion, which comprises the steps of

a. depositing in a desired pattern on a surface of a transparent glass containing at least one light metal at least one heavy metal capable of ion-exchanging with the light metal and of forming monovalent ions upon oxidation,

b. ion-exchanging ions of said light metal with ions of said heavy metal thereby to penetrate said heavy metal ions into said transparent glass, and

c. reducing the penetrated heavy metal ions into a metal atom, and condensing said metal atom to form colloidal particles.

3,864,195

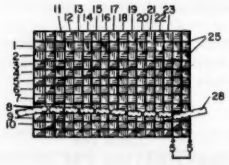
STABLE SYNTHETIC CARPET BACKING MATERIAL

Henry G. Patterson, 1405 Dug Gap Rd., Dalton, Ga. 30720

Division of Ser. No. 221,166, Jan. 27, 1972, , which is a continuation-in-part of Ser. No. 877,777, Nov. 18, 1969, abandoned. This application May 7, 1973, Ser. No. 357,887

Int. Cl. D05c *17/02*

U.S. Cl. 161—66 **7 Claims**



1. A tufted pile fabric comprising a woven sheet of backing material having a substantially uniform thickness and a plain 1/1 weave of substantially uniform flat strands of plastic material; an adhesive material adhering adjacent and crossing strands of plastic material to one another; and rows of carpet yarn piercing said strands and said adhesive material to provide a face of tufted yarn on one side of said woven backing and tuft loop backs of yarn on the other side of said woven backing; all of said adhesive material being disposed on the woven backing material and none of the adhesive material being disposed on the tuft loop backs for said carpet yarn.

3,864,196

HONEYCOMB STRUCTURE FOR USE IN BEE BREEDING

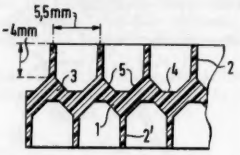
Matthias Schmidt, 8491 Miltach 82, Miltach, Germany

Filed Apr. 10, 1972, Ser. No. 242,354

Claims priority, application Germany, Apr. 17, 1971, 2118676

Int. Cl. B32b *3/12*; **A01k** *47/04*

U.S. Cl. 161—68 **4 Claims**



1. A honeycomb member for use in bee breeding, which comprises:

a center wall and a plurality of reduced walls extending outwardly from both sides of the center wall to provide cell portions on both sides of the center wall, the surface of the center wall in each cell portion being formed with a depression of greater depth in the center thereof than the depth of its adjacent walls,

the height of said plurality of reduced walls being about one-third to one-half of the full size of the cell walls, and said surface of the center wall in each cell portion being of arcuate form.

3,864,197

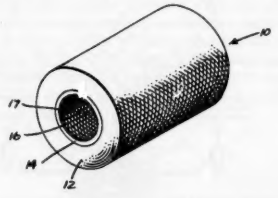
PLASTIC BEARING

Samuel M. Shobert, 17760 Dragoon Trail, Mishawaka, Ind. 46544

Division of Ser. No. 1,833, Jan. 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 800,955, Feb. 20, 1969, abandoned. This application Nov. 14, 1972, Ser. No. 306,295

Int. Cl. F16c *13/00*, *13/02*, *33/00*

U.S. Cl. 161—96 **11 Claims**



1. An article of manufacture comprising a low-friction structure and a hard backing therefor, said hard backing including a plastic material, said low-friction structure having a bearing surface comprising adjacent cords of strands of low coefficient of friction material, each strand consisting of low coefficient of friction material in fiber form and said low coefficient of friction material including fluorocarbon resin, each cord having an irregular outer surface containing a plurality of raised and depressed portions, said strands in each cord being woven together for locating said fibers in place in relation to each other, said cords being interlaced together in a woven fabric which further anchors said fibers against displacement, said cords and fibers being substantially embedded in said plastic material such that the latter mechanically secures said cords and fibers in position, said fibers being undulated throughout the length of said cords with portions of said fibers being exposed through said plastic material to define said bearing surface and other portions being fully embedded

in said plastic material, said plastic material not being chemically or adhesively bonded to said fibers or cords.

8. An article or manufacture comprising a low-friction structure and a hard backing of fiber reinforced plastic therefor, said low-friction structure having a bearing surface comprising adjacent cords of strands consisting of polytetrafluoroethylene fibers, each cord having an irregular outer surface containing a plurality of raised and depressed portions, said strands in each cord being braided together for locating said fibers in place in relation to each other, said cords being interlaced together in a woven fabric which further anchors said fibers against displacement, said cords and fibers being substantially embedded in said plastic material such that the latter mechanically secures said cords and fibers in position, said fibers being undulated throughout the length of said cords with portions of said fibers being exposed through said plastic material to define said bearing surface and other portions being fully embedded in said plastic material, said plastic material not being chemically or adhesively bonded to said fibers or cords.

3,864,198

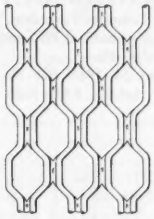
INTERCONNECTED NETWORK STRUCTURES

David B. Jackson, Loveland, Ohio, assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 92,099, Jan. 23, 1970, Pat. No. 3,730,821. This application Jan. 26, 1973, Ser. No. 327,021

Int. Cl. D04h *13/00;* **B32b** *3/30;* **D02** *3/06*

U.S. Cl. 161—109 **4 Claims**



1. A network structure of a thermoplastic material comprising a fibrillated longitudinal striated film having alternating relatively thick longitudinal rib sections and relatively thin longitudinal web sections, said web sections being split between each pair of rib sections about 0.5 to 2.0 times per linear inch with the splits in adjacent web sections being linearly displaced from one another, said film being transversely expanded to form the split web sections into transverse rows of openings with each opening in a row being separated from the adjacent opening by at least two or more rib sections which are interconnected by web sections.

3,864,199

ANGULAR DISCHARGE POROUS SHEET

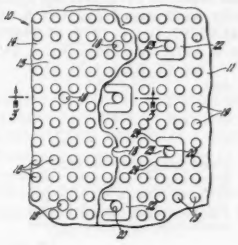
George B. Meginnis, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 26, 1973, Ser. No. 382,906

Int. Cl. F01d *5/08, 5/18;* **B32b** *3/10*

U.S. Cl. 161—112 **4 Claims**

1. A porous sheet adapted to be cooled by flow of fluid through the sheet and to discharge the fluid at an acute angle to the front surface of the sheet comprising a front layer defining the front surface of the sheet having outer and inner surfaces and having distributed fluid exit pores extending through the layer and comprising a rear layer abutting and bonded to the inner surface of the front layer, the rear layer having distributed fluid entrance pores extending through the layer out of register with the pores in the front layer, one of the layers having distributed bosses on its surface contiguous to the other layer engaging the other layer so as to define passages for fluid flowing between the layers from the fluid entrance pores to the fluid exit pores, the sheet being characterized by fluid flow barriers on one layer extending partially



around the entrance to each said exit pore, the said barriers being oriented so that the flow into each exit pore over a defined area of the sheet is constrained to proceed in a direction consistent with that of all other pores within the defined area.

3,864,200

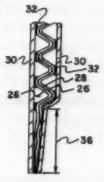
WATERPROOF CORRUGATED BOARD

Elmer Marshall, Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.

Filed Aug. 26, 1971, Ser. No. 175,144

Int. Cl. B32b *3/28*

U.S. Cl. 161—135 **5 Claims**



1. A waterproof corrugated board construction comprising, in combination:

a. a corrugated sheet having attached to the crest of the corrugation on at least one side thereof at least one substantially flat waterproof lining sheet, said corrugated sheet and said lining sheet also having formed throughout a plurality of holes extending completely through said corrugated sheet and said lining sheet;

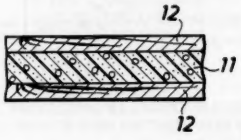
b. said corrugated sheet having formed thereon, between said corrugated sheet and said waterproof lining sheet, a coating of deformable waterproof composition; and

c. the exposed edges of the corrugated board as well as the exposed edges of the holes in the corrugated board being compressed an amount sufficient to compress the corrugated sheet and the lining sheet against the deformable waterproof composition so that the holding characteristics of the composition will serve to hold the compressed shape of the sheet edges as well as around the edges of the holes thereby sealing the edges against the entry of water between the liner and the corrugated sheet.

3,864,201
THERMOPLASTIC RESINS LOADED WITH FILLER BONDED TO COVER LAYERS

Rinnosuke Susuki; Hiroshi Hoshi; Jiro Saito; Koichi Takano, and Kiyoshi Yoshikawa, all of Tokyo, Japan, assignors to Lion Fat and Oil Co., Ltd., Tokyo, Japan

Filed Sept. 30, 1971, Ser. No. 185,244
Claims priority, application Japan, Oct. 6, 1970, 45-99495; Oct. 6, 1970, 45-99497; Oct. 6, 1970, 45-99498; Oct. 6, 1970, 45-99502; Oct. 6, 1970, 49-99503; Oct. 6, 1970, 45-99508
Int. Cl. B32b *3/26, 5/18*
U.S. Cl. 161—160 13 Claims



1. A laminated material comprising at least one layer of a material selected from the group consisting of woody material and metallic material, and bonded thereto in laminated relationship at least one layer of a filled resinous composition of at least one member selected from the group consisting of thermoplastic homopolymer resins, copolymers thereof and mixtures thereof, containing a filler selected from the group consisting of calcium sulfite, gypsum, and mixtures thereof.

3,864,202
SUPPORT MEDIA WITH SUPPORTED OBJECT

William E. Loeb, Martinsville, and Mark A. Spivack, Wachtung, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 167,252, July 29, 1971, abandoned. This application May 24, 1972, Ser. No. 256,531
Int. Cl. B32b *19/02*
U.S. Cl. 161—162 10 Claims

1. An article of commerce comprising an essentially flat film of p-xylylene polymer having a thickness of up to about 25,000 A and wholly supporting one or more discrete objects mounted on at least one face thereof, the total surface area of said objects facing said film being less than the total surface area of the supporting face of said film, said supported objects being ohmically isolated with respect to objects not supported on said one supporting face.

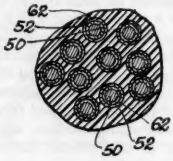
3,864,203
FIBER REINFORCED ELASTOMERS

Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 20, 1970, Ser. No. 91,472
Int. Cl. B44d *1/16, 1/06;* E06b *9/26*
U.S. Cl. 161—175 35 Claims

10. A fiber bundle for use in the reinforcement of elastomeric materials comprising a plurality of metal fibers, each of said fibers having a continuous coating of glass on the surfaces thereof, and an impregnant in the bundle comprising an elastomer compatible polymeric material selected from the group consisting of a blend of a resorcinol-aldehyde resin and rubber, a vinyl pyridine-butadiene-styrene terpolymer, elastomers and resinous polymers, said impregnant completely filling the interstices between the fibers to define a unitary bundle.

25. In the method for treating metal fibers to enhance the bonding relationship of metal fibers with elastomeric materials in the manufacture of metal fiber reinforced elastomeric products in which an elastomer constitutes the continuous phase in which the metal fibers are distributed, the improvement comprising coating the metal fibers with a glass material to form

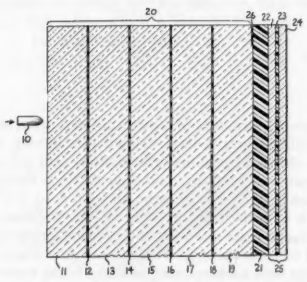


a continuous glass coating thereon, passing the coated fibers through a die to smooth the glass coating formed, and coating the resulting glass coated metal fibers with a material selected from the group consisting of an anchoring agent, an elastomer compatible polymeric material selected from the group consisting of a blend of a resorcinol-aldehyde resin and rubber, a vinyl pyridine butadiene-styrene terpolymer, elastomers and resinous polymers, and mixtures thereof.

3,864,204
MULTILAYERED SAFETY GLASS

Norman Shorr, Mt. Lebanon Township, and Harry E. Littell, Jr., Shaler Township, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 24, 1969, Ser. No. 819,045
Int. Cl. F41h *5/26*
U.S. Cl. 161—190 8 Claims



1. A multiplate safety glass comprising an outward facing, impact striking section including an outer ply of relatively thick glass, a plurality of intermediate plies of relatively thick glass, and an interlayer of transparent thermoplastic material adherent to glass interposed between adjacent glass plies, said interlayers separating said relatively thick glass plies being relatively thin and having a total thickness less than that of any of said relatively thick glass plies in the area intermediate adjacent of said relatively thick glass plies; an impact transition section comprising a relatively thick sheet of transparent thermoplastic interlayer material having a thickness greater than said total thickness in the area facing said glass plies; and an impact absorption section comprising a penultimate, relatively thin glass ply, an innermost, relatively thin glass ply and an interlayer of transparent, thermoplastic interlayer material separating said penultimate, relatively thin glass ply from said innermost, relatively thin glass ply, said interlayer of said impact absorption section having a thickness in the area between said relatively thin glass plies greater than those of said

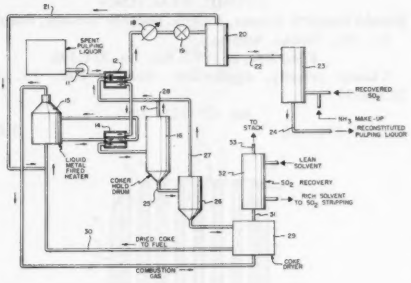
interlayers in said impact striking section and less than that of said impact transition section, the total thickness of said glass plies in said impact absorption section being less than the thickness of each of said plies of relatively thick glass in said impact striking section.

3,864,205

INTEGRATED PROCESS FOR COKING SPENT BASE SULFITE PULPING LIQUORS

William F. Franz, Gardiner; Howard V. Hess, Glenham; Edward L. Cole, Fishkill, and Kenneth E. Neisser, Poughkeepsie, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. Nos. 149,673, June 3, 1971, abandoned, and Ser. No. 149,577, June 3, 1971, abandoned.
This application Aug. 27, 1973, Ser. No. 391,908
Int. Cl. D21c *11/14*
U.S. Cl. 162—31 **8 Claims**



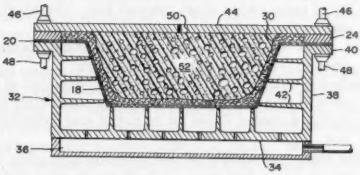
1. In a process for coking spent ammonia and low pH sodium base sulfite wood pulping liquors wherein the liquors are coked in the liquid phase under pressure in a coking zone at a temperature in the range of 400° to 700°F. to produce coke, gases including sulfur dioxide, and an effluent, the improvement consisting of coking said liquors by rapidly heating said liquors to the coking temperature at the rate of about 110° to about 150°F. per minute in the temperature interval of 350° to about 550°F. whereby coke gel formation is avoided and coke separation is improved in the coked pulping liquors.

3,864,206

STRUCTURALLY SUPPORTED, DIMENSIONALLY ACCURATE, SHAPED ARTICLES AND METHOD OF PRODUCING THE SAME

Rodney V. Linderoth, 18 Maple St., Portville, N.Y. 14770

Filed Apr. 17, 1972, Ser. No. 244,556
Int. Cl. B32b *3/00, 5/18*
U.S. Cl. 162—103 **10 Claims**



1. A method of producing dimensionally accurate, structurally supported, shaped articles of pulped fibers comprising the steps of

forming a wet felted mat of pulpped fibers on a foraminous forming mold, the wet felted mat having a hollow portion;

filling the hollow portion of the wet felted mat with a core material while the wet felted mat is supported on the foraminous forming mold;

curing the core material and bonding the same to the wet felted mat to form a core integral with the wet felted mat;

removing the wet felted mat and core from the foraminous forming mold with the core acting in a transfer support capacity before drying of the wet felted mat; and

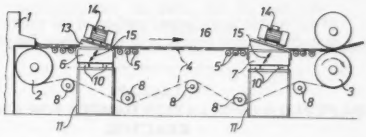
drying the wet felted mat.

3,864,207

PAPERMAKING MACHINE SUCTION BOX WITH VIBRATORY MOVEMENT HAVING BOTH LONGITUDINAL AND VERTICAL COMPONENTS

Frans Hugo Ekberg, Angermanlandsgatan 17, 891 00 Ornskoldsvik, Sweden

Filed June 18, 1973, Ser. No. 370,621
Claims priority, application Sweden, July 17, 1972, 9403/72
Int. Cl. D21f *1/52*
U.S. Cl. 162—365 **6 Claims**



1. Apparatus for dehydrating wet fibrous materials carried on a travelling endless screen, comprising a suction-box having a top plate, resilient means supporting the suction-box under the upper run of said screen with said top plate disposed adjacent the underside of said upper run, and means coupled to the suction-box for imparting vibratory movement thereto having components in the longitudinal direction of said screen and in the vertical direction and of such resultant direction and amplitude that the top plate of the suction-box at least in its highest position contacts the underside of, and moves in the same direction as, said upper run of the screen.

3,864,208

GEOTHERMAL-NUCLEAR WASTE DISPOSAL AND CONVERSION SYSTEM

Allen T. Van Huisen, Rolling Hill Estates, Calif., assignor to Kinichi Watase, Redondo Beach, Calif., a part interest

Filed Apr. 11, 1972, Ser. No. 242,941
Int. Cl. G21f *9/08;* **E21b** *43/25*
U.S. Cl. 176—39 **13 Claims**

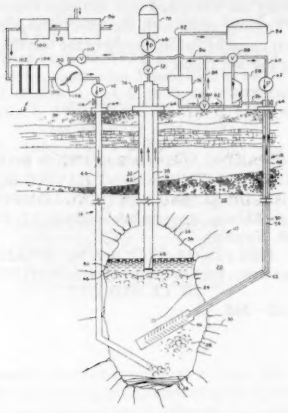
1. A method of recycling organic waste comprising the steps of:

producing a highly permeable cavity containing a bed of hot rock rubble within a deep subsurface geothermal zone having a temperature of at least 300°F. by implanting a thermonuclear device within the zone and detonating the device to produce a porous rubble cone cavity;

forming an aqueous slurry of said organic waste and injecting said aqueous slurry into the cavity at a point substantially below the surface of the rubble cone and directly into the bed of hot rock rubble;

pyrolytically decomposing and destructively distilling the waste within the cavity, in absence of oxygen, into steam

and high BTU value, combustible, hydrocarbon liquid and gaseous fluid products as the waste rises thru the bed



of hot rubble to the upper surface of the rubble cone; and transferring said products to the surface for utilization.

3,864,209

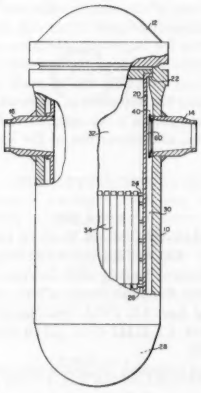
INLET FLOW OSCILLATION DAMPER FOR A NUCLEAR REACTOR

Long S. Tong, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 30,499, April 21, 1970, abandoned. This application Oct. 30, 1972, Ser. No. 302,327

Int. Cl. C21c *15/24*

U.S. Cl. 176—50 **1 Claim**



1. A nuclear reactor comprising:

a reactor core enclosed in a core barrel;

a pressure vessel surrounding and spaced from said barrel the area therebetween defining a fluid coolant passageway of annular configuration;

at least one inlet nozzle extending through the pressure vessel into said annular passageway, and at least one outlet nozzle extending through the core barrel and pressure vessel for accommodating coolant flow from the inlet nozzle through the passageway and reactor core prior to being discharged from the outlet nozzle;

vortex suppressor means adjacent the discharge end of the inlet nozzle for minimizing pressure oscillations otherwise induced in the coolant by coolant flow vortexes after the coolant leaves the inlet nozzle;

said vortex suppressor means comprising an annular member supported on the inner walls of said pressure vessel by a plurality of struts, said vortex suppressor means being in axial alignment with the inlet nozzle and spaced from the core barrel said struts being positioned around said inlet nozzle and being of a size sufficient to space the leading edge of the annular member from the discharge end of the inlet nozzle; and

said annular member further having an inner diameter approximately the same as said inlet nozzle.

3,864,210

APPARATUS FOR COOLING LIQUID METALS IN ATOMIC REACTORS

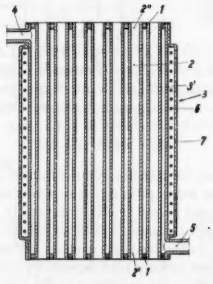
Harald Hanisch, Vienna, Austria, assignor to Gebr. Boehler & Co. AG, Vienna, Austria

Filed Dec. 1, 1972, Ser. No. 311,398

Claims priority, application Austria, Dec. 13, 1971, 10706/71

Int. Cl. G21c *3/56*

U.S. Cl. 176—60 **1 Claim**



1. A heat transferring installation for cooling liquid metals in atomic nuclear reactors or in installations simulating operative conditions of such reactors, comprising in combination,

a cylindrical member having a pair of metallic confronting end plates spaced from each other;

a plurality of straight open-ended pipes of heat-conductive material which are adapted to conduct a gaseous cooling medium and which are mounted in said cylindrical member and are being supported by said end plates;

said cylindrical member having an inner and an outer wall surface and said open-ended pipe have inner and outer surfaces; the inner wall surface only being contacted by liquid metal flowing over the outer surface of said plurality of open-ended pipes through said cylindrical member during the cooling;

the outer wall surface of said cylindrical member is in contact with the ambient atmosphere;

including inlet and outlet means being mounted at opposite ends of said cylindrical member for conducting hot liquid metal in cooled liquid metal out of said cylindrical member;

said inner wall surface of said cylindrical member is formed by an inner wall made of heat conducting material and said outer wall surface is formed by an outer wall made of heat-insulating material, said outer and inner walls being spaced from each other and defining an annular space therebetween, and a heating coil disposed in said annular space for heating the liquid metal in said cylindrical member, whereby solidified metal present within the

installation can be melted bysaid coil so that the liquified metal may flow through the installation.

3,864,211
REMOVABLE UPPER TIE PLATE
Lloyd L. King, Benton City, and Robert K. Marshall, Richland, both of Wash., assignors to Exxon Nuclear Company, Inc., Richland, Wash.
Filed Oct. 2, 1972, Ser. No. 294,213
Int. Cl. G21c 3/32
U.S. Cl. 176—78 6 Claims

1. In a nuclear power reactor fuel bundle having tie rods for securing a pair of spring-biased fuel rod mounting upper and lower tie plates in assembled position, the improvement which comprises:

a. a locking means attached to the end of each of said tie rods which engages said upper tie plate and moveable relative to said tie rod and an integral seat means within an opening in the upper one of said tie plates and facing away from said fuel rods for receiving said locking means and thereby locking said tie rods into said plates against the separating force of said fuel rod springs, said locking means comprising a cylindrical member coaxially moveable relative to said tie rod and having at least one cam means projecting radially outward from the surface of said cylindrical member;

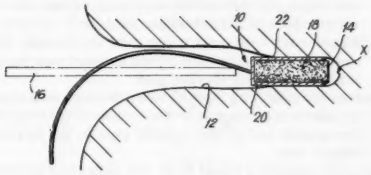
b. cam operator means disposed within said opening in said upper tie plate for rotating said cylindrical member by coacting with said cam means when said tie rod is moved through said opening in the upper tie plate until said locking means is above said seat means; and

c. spring means for urging said locking means into locking engagement with said integral seat means in said upper tie plate after said locking means is above said seat means and thereby securing said tie rods to said tie plate, said spring means comprising a torsion spring attached at one end to said tie rod and at its opposite end to said cylindrical member whereby said torsion spring resists rotation of said cylindrical member relative to said tie rod.

3,864,212
TREATMENT OF CELLS FOR MEASUREMENT OF DNA
Ernst Berkhan, Gottingen, Germany, assignor to Phywe Aktiengesellschaft, Gottingen, Germany
Filed May 25, 1972, Ser. No. 256,822
Claims priority, application Germany, May 25, 1971, 2125699
Int. Cl. C12k 1/00
U.S. Cl. 195—103.5 R 3 Claims

3. A treatment of cells for measurement of DNA therein comprising: initially isolating the nuclei of the cells by treating the cells with a solution of pepsin in hydrochloric acid and thereafter separating them from the solution and from the cell plasma, then dyeing the isolated nuclei in a dye solution which takes effect on nucleic acids and causes fluorescence, and measuring the intensity of fluorescence caused by said dyes by passing a liquid suspension of said dyed nuclei through a flow-through optical measuring chamber.

3,864,213
CULTURING METHOD
Louis Bucalo, Holbrook, N.Y., assignor to Microbyx Corporation, Holbrook, N.Y.
Continuation-in-part of Ser. No. 329,862, Feb. 5, 1973,. This application Oct. 12, 1973, Ser. No. 405,939
Int. Cl. C12k 1/04
U.S. Cl. 195—103.5 R 9 Claims



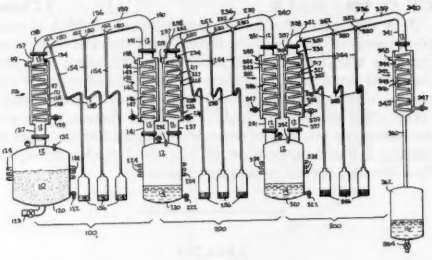
1. In a culturing method, the steps of placing one part of a wick within a body in engagement with a body fluid while maintaining an opposed part of the wick which is distant from said one part out of engagement with the body fluid so that the body fluid progresses by capillary action along the wick from said one part toward said opposed part thereof, maintaining in engagement with the wick a culture medium which will encourage predetermined micro-organisms to grow to be subsequently rendered visible if present in the body fluid, limiting the progress of the body fluid along the wick from said one part toward said opposed part thereof for providing a distribution of the body fluid from said one part toward said opposed part of the wick according to a density gradient which is most dense at said one part of the wick and which becomes gradually less dense toward said opposed part of the wick so that the micro-organisms, if they are present, will be capable of growing into discrete colonies in sufficient numbers to become visible with great clarity at a portion of the density gradient, removing the wick from its position within the body where said one part thereof engages the body fluid after a given time, and thereafter checking for the presence of the micro-organisms.

3,864,214

APPARATUS FOR THE PLURAL STAGE DISTILLATION OF DRINKING ALCOHOL

Evald Ohakas, 1266 Sheridan Ave., Apt. 3F, Bronx, N.Y. 10456

Filed Nov. 7, 1972, Ser. No. 304,347
Int. Cl. B01d *3/00*
U.S. Cl. 202—186 **5 Claims**



1. An apparatus for distillation of drinking alcohol, comprising:

a plurality of interconnected stages, each stage comprising:

a boiler having an inlet and an outlet which discharges alcoholic vapors,

an outlet condenser in heat conducting contact with the vapors from the outlet of said boiler,

an inclined pipe having a first end and a second end, said first end communicating with said outlet condenser to receive vapors which have passed from the outlet of said boiler through said outlet condenser, and said second end of the inclined pipe communicating with the inlet of the boiler in the next one of said stages to discharge vapors thereinto, said inclined pipe having an intermediate section between said ends upwardly inclined away from said boiler, and the bottom wall of said intermediate section of said inclined pipe having at least one opening therein, and

means for collecting liquid flowing through said opening;

a collection condenser in heat conducting contact with the second end of the inclined pipe in the last of said stages; and

means for collecting liquid from said collection condenser;

wherein the outlet condenser in at least one of said stages is comprised of a tubular outer wall, a tubular inner wall corresponding generally to said outer wall to form an annular space between said inner and outer walls, a plurality of downwardly sloping hollow baffles extending partially inwardly from different longitudinal positions along said inner wall and communicating with said annular space for the passage of liquid therebetween, alternate ones of said baffles extending inwardly from the inner wall on opposite sides of the condenser, said baffles extending substantially more than half way to the inner wall on the opposite side of said condenser so as to form a zig-zag shaped passageway bounded by said baffles and said inner wall for the passage of vapors through said outlet condenser, and means for controlling the flow of liquid into said annular space and said baffles.

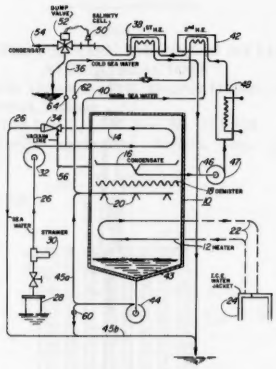
3,864,215

METHOD OF DISTILLING SEA WATER ON SMALL SHIPS AND MARINE PLATFORMS HAVING INTERNAL COMBUSTION ENGINE

Alanson J. Arnold, 16 Bluebird St., New Orleans, La. 70124

Filed Feb. 11, 1974, Ser. No. 441,077
Int. Cl. B01d *1/22, 3/00, 3/08, 3/10*
U.S. Cl. 203—11 **3 Claims**

1. Improved method of distilling fresh water from sea water on marine structures with internal combustion main engines, comprising the steps of: circulating hot water from water-jacketed main engines to heater tubes mounted in a closed chamber; circulating cold sea water to provide condensive cooling through condenser tubes mounted in said closed chamber above said heater tubes and above the liquid level therein, and through a first heat exchanger mounted adjacent said closed chamber to provide cooling therein; circulating a portion of the sea water warmed from said condenser tubes to a second heat exchanger for further heating to circulate as sea water for evaporation; Creating a vacuum in said closed chamber with a venturi through which flows the remaining portion of said sea water warmed in said condenser tubes which is then wasted by connecting a low pressure area of said venturi to the vapor space of said closed chamber, said vacuum being at least sufficiently high to flash vaporize sea water at slightly



below the temperature of said circulating hot water from water-jacketed main engines; spraying heated sea water from said second heat exchanger over said heater tubes to flash vaporize part into rising vapor and the remainder falling to bottom of the closed chamber; pumping said remainder partially back to said spraying and partially overboard; condensing said rising vapor on said condenser tubes as condensate dripping therefrom; catching said condensate in a collector means mounted below said condenser tubes; Pasteurizing said condensate in a heater; simultaneously cooling said hot pasteurized condensate and heating said warmed sea water in said second heat exchanger; further cooling said condensate with cool sea water in said first heat exchanger; and testing salimity of condensate in a salinity cell for acceptance or rejection.

3,864,216

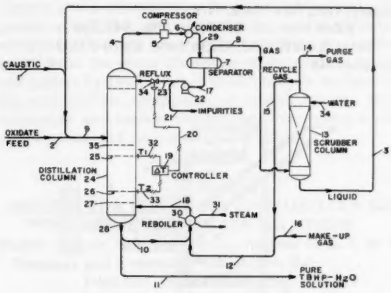
TERTIARY BUTYL HYDROPEROXIDE PURIFICATION BY DISTILLATION AT ATMOSPHERIC PRESSURE WITH AN INERT DILUENT GAS

George R. Worrell, Media, Pa.; Edward G. Guetens, Glendora, N.J., and James T. O'Toole, Philadelphia, Pa., assignors to Atlantic Richfield Company, New York, N.Y.

Continuation-in-part of Ser. No. 68,907, Sept. 2, 1970, abandoned. This application Nov. 6, 1972, Ser. No. 304,278
Int. Cl. B01d *3/34*
U.S. Cl. 203—49 **3 Claims**

1. In a process for the purification and recovery of tertiary butyl hydroperoxide from an isobutane-free isobutane oxidate wherein said oxidate is fractionally distilled at about atmospheric pressure in a columnar distillation zone in the presence of water vapor, said water vapor being produced by the vaporization in said distillation zone of water introduced into said distillation zone together with said oxidate at a point in the mid-section of said distillation zone, the weight ratio of said water to the tertiary butyl hydroperoxide in said oxidate being at least 5:1, the improvement comprising introducing a

non-soluble, non-condensing diluent gas selected from the group consisting of methane and nitrogen at a point near the bottom of said distillation zone to dilute vapors formed in said zone and in an amount such that flamable tertiary butyl hydroperoxide-water vapor mixtures are avoided throughout said distillation zone, said methane being maintained in a proportion of at least 60 per cent by volume in the vapor



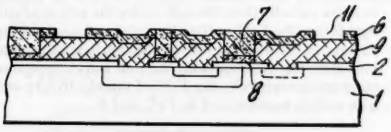
phase, said nitrogen being maintained in a proportion of at least 80 per cent by volume in the vapor phase, removing from the bottom of said columnar distillation zone a bottoms fraction of purified tertiary butyl hydroperoxide and water and removing from the top of said columnar distillation zone an overhead comprising the oxidate impurities and said diluent gas.

3,864,217

METHOD OF FABRICATING A SEMICONDUCTOR DEVICE

Koichiro Takahata, and Hiroshi Shiba, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Jan. 21, 1974, Ser. No. 434,259
Int. Cl. C23b *5/48*
U.S. Cl. 204—15 **8 Claims**



1. A method of fabricating a semiconductor device which device includes a semiconductor substrate and an insulating film covering at least one major surface of said substrate including the steps of:

forming openings in said insulating film to expose portions of said major surface of said substrate;

forming a thin film of the same semiconductor material as said substrate over said insulating layer and said exposed portions of said substrate;

forming a metallic film over said thin film of semiconductor meterial;

selectively converting at least a portion of the material of said metallic film and said semiconductor thin film into the oxides of their respective materials by anodic oxidation; and

heating said device to alloy at least a portion of said metallic film with said semiconductor thin film.

3,864,218

METHOD FOR PRODUCING WROUGHT ALUMINUM ARTICLES HAVING A COLORED ANODIC OXIDATION FILM

Ichiro Mizukami, and Masahiro Takahasi, both of Shimizu, Japan, assignors to Nippon Light Metal Research Laboratory Limited, Tokyo, Japan

Continuation of Ser. No. 211,041, Dec. 22, 1971,. This application July 19, 1973, Ser. No. 380,696
Claims priority, application Japan, Dec. 26, 1970, 20-118550/45
Int. Cl. C23b *5/50, 9/02*
U.S. Cl. 204—29 **7 Claims**

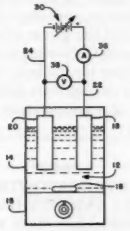
1. A method for producing a wrought aluminum article having a pale silvery colored anodic oxidation film which comprises the steps of casting a body of an aluminum alloy containing about 1–3 percent by weight of iron and about 0.02 to less than about 0.2 percent by weight of silicon, with the balance aluminum, working said cast aluminum body into a wrought aluminum article, anodically oxidizing the thus obtained wrought aluminum article in an aqueous electrolyte consisting of sulfuric acid within a concentration range of about 10–20 percent at anodizing current density less than 2 amp/dm^2 and at a temperature of about room temperature and after said casting step but before said anodically oxidizing step, heat-treating said article at a temperature of above about 550°C but insufficient to alter the shape of the article.

3,864,219

PROCESS AND ELECTROLYTE FOR APPLYING BARRIER LAYER ANODIC COATINGS

Robert G. Dosch, and Thomas S. Prevender, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Jan. 8, 1974, Ser. No. 431,818
Int. Cl. C23b *9/02, 11/02*
U.S. Cl. 204—33 **10 Claims**



1. The method for forming an anodized, essentially porefree film on metals selected from the group consisting of niobium, tantalum, tungsten, titanium, beryllium, uranium, aluminum, and alloys thereof, comprising cleaning said metal, thereafter immersing said metal in an electrolyte comprising a quaternary ammonium compound having the general formula (R_4N)($M_xO_yH_z$) where R is selected from the group consisting of an alkyl group having from 1 to 4 carbon atoms, an aryl group and mixtures thereof, N is nitrogen, O is oxygen, H is hydrogen, and M is a metal selected from the group consisting of niobium, tantalum, and titanium, and x is at least two, said quaternary ammonium compound dissolved in a solvent of water and a polar, water soluble organic liquid selected from the group consisting of an alcohol having the general formula ROH where R is an alkyl group having from 1 to 3 carbon atoms, and ethylene glycol, attaching said metal to an electrical lead to make it an anode, applying current to said anode while in said electrolyte for a time sufficient to form said film, and thereafter removing said anodized metal from said electrolyte.

3,864,220

METHOD FOR REDUCING HYDROGEN ABSORPTION OF ZIRCONIUM BY ANODIZING

Richard F. Denning, Hastings, and Stuart D. Bresnick, West Nyack, both of N.Y., assignors to General Atomic Corporation, San Diego, Calif.

Continuation of Ser. No. 112,473, Feb. 3, 1971, abandoned. This application Sept. 20, 1972, Ser. No. 290,508

Int. Cl. C23b 5/52

U.S. Cl. 204—37 R 8 Claims

1. A method for reducing hydrogen absorption and embrittlement of zirconium and zirconium alloy nuclear reactor structural elements which comprises forming at least a portion of a nuclear reactor structural element from a metal selected from the group consisting of zirconium and zirconium alloys, placing said metal portion of said structural element as an anode in an aqueous acidic electrolytic bath, applying a sufficient voltage across said anode to cause the formation of an anodized film on the said metal portion of said structural element and heat treating the anodized metal portions of said structural element in an atmosphere of at least one of air and inert gas containing about 2 to 3 percent oxygen by volume to impart an oxide film to the surface thereof without causing substantially any hydrogen absorption, and thereafter incorporating said structural element in a nuclear reactor.

3,864,221

COATING OF A STEEL OR IRON WITH A CHROMIUM CONTAINING SURFACE LAYER

Lars Henry Ramqvist, Nynashamn, and Henrik Werme, Garphyttan, both of Sweden, assignors to Rederiaktiebolaget Nordstjernan, Stockholm and AB Garphytte Bruk, Garphyttan, both of, Sweden

Filed June 22, 1973, Ser. No. 372,618

Claims priority, application Sweden, July 7, 1972, 9011/72

Int. Cl. C23b 5/00; C23f 17/00

U.S. Cl. 204—38 R 2 Claims

1. A process for producing a ductile metal coating consisting essentially of chromium on carbon-containing steel or iron substrate which comprises, applying a barrier layer of at least one metal selected from the group consisting of Cu, Ag, Au, Pd, Pt, Rh, Ir, Ru, Os and CuNi alloy to said substrate and then depositing on said barrier layer a layer consisting essentially of said chromium by electrolysis from a molten salt bath containing chromium halide at a temperature in excess of 700°C.

3,864,222

BATHS FOR ELECTRODEPOSITION OF GOLD AND GOLD ALLOYS AND METHOD THEREFORE

William A. Wilson, Pawtucket; Hana M. Hradil, and Edward F. Hradil, both of Warwick, all of R.I., assignors to Technic, Inc., Cranston, R.I.

Filed Mar. 26, 1973, Ser. No. 344,887

Int. Cl. C23b 5/28, 5/42, 5/46

U.S. Cl. 204—43 G 15 Claims

1. An aqueous bath for electrodeposition of gold and gold alloys comprising, in said bath,

gold in solution as a water soluble compound thereof,

alloying metal as a salt in an amount from 0 to 20 grams of metal per liter of solution,

electrical conductivity enhancing electrolyte selected from the group consisting of phosphoric, phosphonic, phosphinic, citric, malic, formic, and ethylene polyamino acetic acids in amount from about 6 to 16 ounces per gallon of solution,

a compound selected from the group consisting of polyethyleneimines derived from polymerized ethyleneimine, substituted ethyleneimines or polyethyleneimines derived from the addition of ethyleneimine to organic or inorganic molecules,

said imine compound being present in amount from 0.005 to 100 grams per liter of bath and said compound having a molecular weight in the range from 100 to 60,000,

said bath being adjusted to pH operating level in the range from 1 to 14.

3,864,223

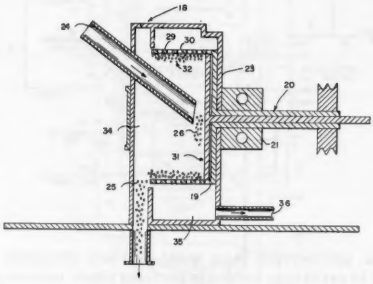
METHOD OF REGENERATION SPENT IRON ELECTROPLATING SOLUTIONS WITH CONCOMITANT DESULFURIZATION OF COAL

Robert E. Colwell, Palos Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Mar. 21, 1973, Ser. No. 343,330

Int. Cl. C01l 9/02; C23b 5/04; C01b 17/02

U.S. Cl. 204—48 4 Claims



1. A process for effecting the regeneration of spent electrolyte solutions obtained from iron plating baths comprising the steps of:

charging coal particles containing iron sulfides to a reaction chamber having a plurality of openings in its sidewalls, the size of the openings being smaller than the size of the particles,

rotating the chamber with sufficient rotational speed to generate a centrifugal force to cause the particles to be propelled outwardly against the walls of the chamber and be fixed thereon to form a continuous bed of particles,

charging spent electrolyte solution comprised of an aqueous solution of Fe^{3+} to the rotating chamber, the electrolyte solution being propelled outward into contact with the particle bed fixed on the walls of the chamber and caused to move radially therethrough under the action of centrifugal force, the Fe^{3+} in the electrolyte solution during the passage of the solution through the particle layer entering into chemical reaction with the iron sulfide contained in the particles whereby the Fe^{3+} of the electrolyte and the iron sulfide is converted to Fe^{2+} and S.

3,864,224

PREPARATION OF OXIDES

Joseph Bernard Cotton, Sutton Coldfield; Peter Charles Steele Hayfield, Castle Bromwich, and Ian Robert Scholes, Sutton Coldfield, all of England, assignors to Imperial Metal Industries (Hynoch) Limited, Warwickshire, England

Filed Apr. 25, 1972, Ser. No. 247,322

Claims priority, application Great Britain, Apr. 28, 1971, 11884/71

Int. Cl. C23b 9/00

U.S. Cl. 204—56 R 11 Claims

1. A method of preparing a titanium oxide comprising taking an acid solution containing titanium cations, inserting in the solution first and second electrically conductive bodies, and applying a voltage to the first electrically conductive body to render it anodic with respect to the second electrically conductive body and precipitating a porous coating of titanium dioxide alone upon the first body.

3,864,225

ELECTROLYTIC CARBOXYLATION OF SUBSTITUTED OLEFINS

Donald Armon Tyssee, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 17, 1972, Ser. No. 307,753
Int. Cl. C07b *29/06*; **C07c** *51/40, 55/02*
U.S. Cl. 204—59 R **10 Claims**

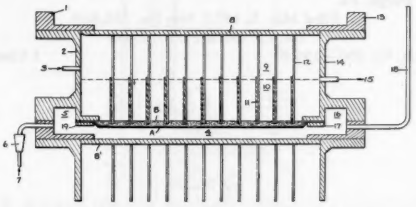
1. The method of electrolytic dicarboxylation of alpha, beta-olefinic nitriles, esters, and carboxamides, having an organic group selected from oxy, thio, phosphino and amino groups attached to one of the olefinic carbon atoms, which comprises effecting electrolytic reduction at a cathode selected from the group consisting of mercury, cadmium, lead and carbon by electrolysis in an electrolysis medium comprising such olefinic compound, an apratic solvent, supporting electrolyte and carbon dioxide, and recovering a dicarboxylated product of such olefinic compound.

3,864,226

PROCESS FOR ELECTROLYZING AQUEOUS SODIUM OR POTASSIUM ION SOLUTIONS

Robert Spitzer, New York, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 19, 1972, Ser. No. 298,922
Int. Cl. C01d *1/06, 1/08*; **C01b** *67/06*
U.S. Cl. 204—98 **23 Claims**



1. A process for the electrolysis of an aqueous solution containing sodium and/or potassium ions in solution with anions of the mineral acids and/or of the organic acids and/or hydroxyl ion, wherein said electrolysis would normally produce a gaseous anode product at atmospheric pressure in said solution, which comprises

passing an electric current through said solution which is between

an anode and

a composite membrane of

a polymeric membrane facing said anode and

a layer of metal permeable to alkali metal in intimate contact with said polymeric membrane at its surface facing away from said anode, and

conducting said electrolysis at pressures between about 100–1000 psi and temperatures between about 60°–270°F under conditions which produce said anode product in a substantially liquefied state or dissolved within said solution.

3,864,227

METHOD FOR THE ELECTROLYTIC REFINING OF COPPER

Walter L. Brytczuk, Roselle Park, and Milton J. Hauser, Scotch Plains, both of N.J., assignors to Amax Inc., New York, N.Y.

Filed June 20, 1973, Ser. No. 371,876
Int. Cl. C22d *1/16*; **C23b** *7/00*; **B01k** *3/00*
U.S. Cl. 204—108 **5 Claims**

1. An electrolytic process for producing heavy deposits of high purity copper on a cathode at improved production rates which comprises,

selecting a metal cathode material which is self-passivating in a copper sulfate electrolyte,

said cathode metal being characterized by a negative free energy of formation of the oxide of at least about 90,000 calories per gram atom of oxygen at about 25°C,

providing a plating system comprising a plurality of said cathodes immersed in said copper sulfate electrolyte alternately spaced between anodes,

continuously subjecting said system to a periodic forward and reverse flow of current from said anodes to said cathodes and from said cathodes to said anodes, respectively,

said forward flow of current being carried out for a time ranging from about 10 seconds to 100 seconds, at a current density of about 20 to 65 amps/sq.ft.,

said reverse flow of current being carried out for a time ranging from about one-fifteenth to one-fiftieth of the time employed in the forward flow of current, the reverse flow of current being maintained at a current density level of 15 to 65 percent less than the current density corresponding to the forward flow of current, and maintaining said periodic application of the current to said system until a heavy deposit of strippable high purity copper is obtained on said cathodes.

3,864,228

MOLDABLE AND HEAT RECOVERABLE COMPOSITION COMPRISING AN ADMIXTURE OF VINYLIDENE FLUORIDE/HEXAFLUOROPROPYLENE COPOLYMER AND A POLYMER OF VINYLIDENE FLUORIDE

Louis F. Rossetti, Jr., Arlington, Mass., assignor to Electronized Chemicals Corporation, Burlington, Mass.

Continuation of Ser. No. 137,620, April 26, 1971, abandoned. This application July 13, 1973, Ser. No. 378,807
Int. Cl. C08d *1/00*; **C08f** *1/00*
U.S. Cl. 204—159.2 **3 Claims**

1. A novel thermosetting composition comprising an admixture of vinylidene fluoride/hexafluoropropylene copolymer, containing from 70 to 30% by weight of vinylidene fluoride units and from 30 to 70% by weight of hexafluoropropene units, and a polyvinylidene fluoride, cross-linked by irradiation with highenergy electrons in a range of approximately 1–20 megarads, and wherein the ratio of weight of vinylidene fluoride/hexafluoropropylene copolymer to vinylidene fluoride polymer is in the range of 225:275 to 70:430.

3,864,229

POLYTHIOL ACCELERATED RADIATION CROSS-LINKING OF OLEFINICALLY UNSATURATED POLYMERS

Robert L. Zapp, Short Hills, and Alexis A. Oswald, Mountainside, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

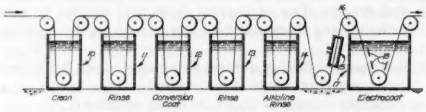
Filed Mar. 6, 1972, Ser. No. 232,275
Int. Cl. B01j *1/10, 1/12*
U.S. Cl. 204—159.18 **15 Claims**

1. In a process for the curing of an elastomer having a number average molecular weight of at least 50,000 using ionizing radiation, wherein said elastomer is an olefinically unsaturated elastomer having (1) at least 15 mole % unsaturation the improvement which comprises incorporating into the elastomer vulcanization mixture about 0.6 to about 6 parts per hundred by weight of elastomer of a cure enhancer comprising a hydrocarbon polythiol having about 3 to about 5 thiol groups and a molecular weight of about 200–1,000 selected from the group consisting of (1) the reaction product of cyclododecatriene and 1,3 propane dithiol, (2) the reaction product of trivinylcyclohexane and H_2S, (3) the reaction product of trivinylcyclohexane and ethane dithiol, or (4) the reaction product of trivinylcyclohexane and 1,4 butanedithiol.

3,864,230
PRETREATING AND ELECTROCOATING METAL PRODUCTS

Willard J. Springer, Livermore, and Bruce A. Baker, Jr., Pleasanton, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Jan. 9, 1974, Ser. No. 431,853
Int. Cl. C23b *13/00*
U.S. Cl. 204—181 6 Claims

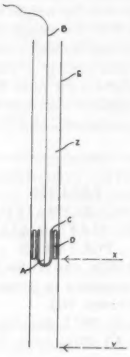


1. In the method of electrocoating a metal surface wherein the metal surface is treated so as to form thereon a chemical conversion coating, subsequently the metal surface is immersed as an electrode in an aqueous bath containing an electrodepositable polyelectrolyte resin and an electrical current is passed between said product and an electrode in said bath so as to electrodeposit said resin onto said surface, the improvement comprising treating the metal surface having a chemical conversion coating thereon with an aqueous alkaline solution having a pH greater than 8.

3,864,231
APPARATUS FOR MEASURING IN A CONTINUOUS MANNER OXYGEN IN A MOLTEN METAL

Frederick Denys Richardson, Epsom, England, assignor to Mettallurgie Hoboken-overpelt, Brussels, Belgium; RST International Metals Limited, London, England; a part interest

Filed Jan. 15, 1973, Ser. No. 323,493
Claims priority, application Luxembourg, Jan. 31, 1972, 64699
Int. Cl. G01n *27/30, 27/46*
U.S. Cl. 204—195 S 15 Claims



1. Apparatus for the continuous measurement of oxygen contained in a molten metal comprising

a. a cell which comprises:

i. means for measuring the electrochemical potential present between two faces of a solid oxygen electrolyte: ii. one of said two faces being in contact with a controlled oxygen pressure used as a reference; and

iii. the other of said two faces being adapted to be contacted with the metal which is to be tested;

b. an outer tube having a high resistance to mechanical stresses, to thermal shocks and to chemical attack;

c. said outer tube containing at its lower end a projecting sleeve of high resistance to mechanical stresses, to thermal shocks and to chemical attacks;

d. said projecting sleeve being adapted to be dipped into the liquid metal before the cell is immersed in the liquid metal in order to conduct heat from the liquid metal to the cell and to preheat the cell prior to immersion;

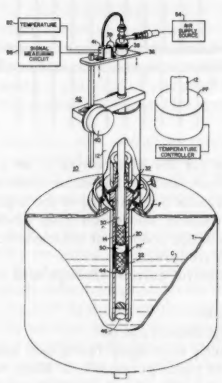
e. said projecting sleeve being adapted to contain a volume of trapped air which is present between the surface of the liquid metal and the solid electrolyte when the cell is dipped into the liquid metal; and being adapted upon immersion to permit expansion of said trapped air to blow away slag, oxides, and other foreign particles which may be present on the surface of the metal being tested, and being adapted to reduce the thermal shock to which the solid electrolyte is subjected; and

f. a column of cement provided between the outer tube and solid electrolyte wherein said cement is gas pervious for allowing said trapped air to be displaced by the hydrostatic pressure of the liquid metal upon immersion, and the porosity and length of the column of cement being adjusted to ensure delay between the immersion and rising of the liquid metal up to said solid electrolyte.

3,864,232
APPARATUS FOR MONITORING THE OXYGEN CONTENT OF HIGH TEMPERATURE FLUIDS

Lawrence M. Handman, Cherry Hill, N.J.; Charles E. Spangler, Pittsburgh, Pa., and Raymond F. Thompson, Bristol, Va., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 2, 1973, Ser. No. 356,669
Int. Cl. G01n *27/30, 27/46*
U.S. Cl. 204—195 S 1 Claim



1. Apparatus for monitoring the oxygen content of molten metal comprising, an open ended tubular member, a solid electrolyte electrochemical cell cell means including an oxygen ion conductive solid electrolyte having an external surface and an internal surface, an electrode means disposed in intimate contact with said internal surface and a reference medium of known oxygen content in contact with said internal surface, said solid electrolyte electrochemical cell means being slidably positioned within said tubular member, said tubular thermal insulating member being adapted for positioning relative to said molten metal, adjustment means for slidably positioning said solid electrolyte electrochemical cell means to project said solid electrolyte electrochemical cell means through the open end of said tubular thermal insulating member to establish said external surface of said solid electrolyte in direct contact with said molten metal and to retract said solid electrolyte electrochemical cell means within said tubular thermal insulating member, said solid electrolyte electrochemical cell developing a signal indicative of the oxygen content of said molten metal, and electrical heater means

located within said tubular thermal insulating member at a position adjacent to said solid electrolyte electrochemical cell means to maintain the temperature of said solid electrolyte electrochemical cell at a temperature comparable to that of the molten metal prior to insertion of said solid electrolyte electrochemical cell into said molten metal.

3,864,233

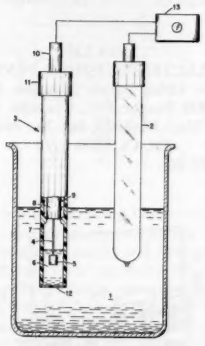
URANIUM-SENSITIVE ELECTRODE MEMBRANE

William C. Dietrich, Knoxville, and Delmer L. Manning, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Dec. 17, 1973, Ser. No. 425,415

Int. Cl. G01n *27/46*

U.S. Cl. 204—195 M **6 Claims**



1. A uranyl sensitive membrane comprising a uranyl complex of an organophosphoric acid embedded within a polyvinyl chloride matrix, said organophosphoric acid being selected from the group consisting of di (2-ethylhexyl) phosphoric acid, di (2-ethyl-4 methyl-pentyl) phosphoric acid, and mono-n-butyl phosphoric acid.

3,864,234

CATHODIC PROTECTION SYSTEM FOR WATER HEATERS WITH SEALANT

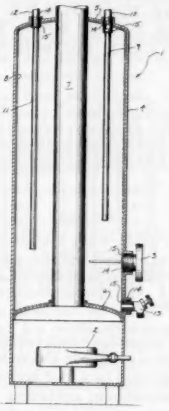
Loerwood C. Wasson, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed May 8, 1973, Ser. No. 358,369

Int. Cl. C23f *13/00;* **F24h** *1/00, 1/20*

U.S. Cl. 204—197 **5 Claims**

1. A substantially closed metal tank having a lining disposed on the inside of the tank of a material to protect the metal of the tank from corrosion by the fluid stored within the tank, but leaving some bare metal exposed to said fluid throughout various areas of the tank, a primary anode more anodic than the exposed metal of the tank and secured to the tank and extending therein in contact with the fluid stored in said tank to cathodically protect the exposed bare metal in the tank, a plurality of fittings secured within openings in the metal tank and forming joints with the tank at said openings in which bare metal may be exposed to the fluid in the tank, and a sealant separate from said fittings disposed in said joints and covering the exposed metal of the tank at the joint area and having particles of metallic material therein more anodic than the metal of the tank distributed throughout said joints, said sealant expanding in volume as products of corrosion are produced in the joints from said particles by contact with the fluid in the tank to increase the sealing effect of the sealant and acting as a secondary distributed anode to cathodically protect the exposed metal in the joints and initially charge any exposed metal in the joints so that less potential is later required to be developed in the joints by the primary anode to provide corrosion protection in the event the distributed anode is used up.



3,864,235

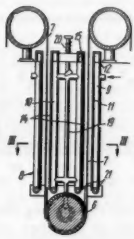
LOOP ELECTROLYZER

Vyacheslav Borisovich Bobrov, Yaroslavakaya ulitsa 1/9 kv. 30; Antonina Vladimirovna Buzhinskaya, Murmansky Proezd, 6, kv. 54; Vadim Afanasievich Semenenko, ulitsa Trofimova, kv. 82, all of Moscow, U.S.S.R.; Anatoly Borisovich Bobrov, deceased, ulitsa Arbat, 51, kv. 117, late of Moscow, U.S.S.R., and Evdokia Nikolaevna Bobrova, administrator, Konkov-Derevlevo, I Mikroraion, korpus 4, kv. 118, Moscow, U.S.S.R.

Continuation of Ser. No. 174,767, Aug. 25, 1971, abandoned. This application Dec. 4, 1972, Ser. No. 311,642

Int. Cl. C23b *5/68*

U.S. Cl. 204—206 **4 Claims**

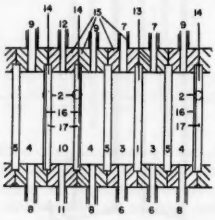


1. A loop electrolyzer for producing metal strip, comprising: a container for holding a bath of electrolyte; a plurality of top driven current-carrying drums mounted on the sides of said container; a plurality of bottom tension drums located inside said container and rotating on journals; a cathode ribbon movably passing in between said top driven drums and said bottom tension drums; a plurality of anode plates having their vertical edges flanged and each attached to separate detachabley mounted frames arranged consecutively in the direction of travel of said cathode ribbon inside said container, each of said frames comprising single separate sections and a twinned section disposed therebetween.

3,864,236
APPARATUS FOR THE ELECTROLYTIC PRODUCTION OF ALKALI

Olle Lindstrom, L. Taby, Sweden, assignors to Hooker Chemical & Plastics Corp., Niagara Falls, N.Y.

Filed Sept. 29, 1972, Ser. No. 293,623
Int. Cl. C22d *1/02*; B01k *3/10*
U.S. Cl. 204—265 2 Claims

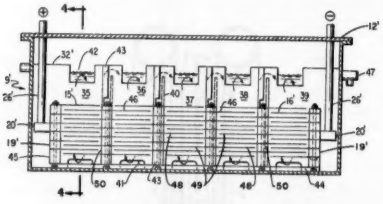


1. An electrolytic apparatus which comprises a cell, said cell having disposed therein a cathode and an anode, said cathode and anode being separated by a fluid permeable diaphragm to form an anode compartment containing said anode and a cathode compartment containing said cathode, said apparatus having means for passing hydrogen gas through said anode into said anode compartment, said anode including a catalyst for the electrochemical oxidation of hydrogen gas to hydrogen ions, said anode being formed in two layers, said first layer being a porous sintered coarse layer of platinized titanium and said second layer being a porous sintered finer layer of titanium, said anode being positioned so that the hydrogen gas is passed initially through said first layer and then through said second layer into the anode compartment.

3,864,237
BIPOLAR DIAPHRAGMLESS ELECTROLYTIC CELLS

Richard E. Loftfield, Chardon, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 220,902, Jan. 26, 1972, Pat. No. 3,791,947. This application Oct. 9, 1973, Ser. No. 404,492
Int. Cl. B01k *3/04*
U.S. Cl. 204—268 4 Claims



3. In an electrolytic cell comprising side, end, and bottom walls defining an electrolyte chamber, said chamber having disposed therein a multiunit electrode assembly, the improvement wherein said assembly comprises:

A. a terminal anode assembly consisting essentially of a plurality of parallel, horizontally disposed, foraminous, dimensionally stable anodes;

B. a terminal cathode assembly consisting essentially of a like number of parallel, horizontally disposed, foraminous, cathodes;

C. at least one bipolar electrode assembly intermediate said terminal anode and terminal cathode assemblies, each bipolar assembly consisting essentially of a vertically disposed, electrically insulating and liquid impervious partition and a plurality of parallel, horizontally disposed, foraminous, bipolar electrodes extending through said partition, the portion of the bipolar electrode adjacent the terminal anode assembly being cathodes and being interleaved with the terminal anodes in an alternate, face-to-face, spaced apart arrangement, the portion of the bipolar electrode adjacent the terminal cathode assembly being dimensionally stable anodes and being interleaved with the terminal cathodes in an alternate, face-to-face, spaced apart arrangement, all other bipolar electrode portions being interleaved with horizontally adjacent bipolar electrode portions in a like fashion;

D. the entire multiple unit electrode assembly being substantially enclosed on four sides; and

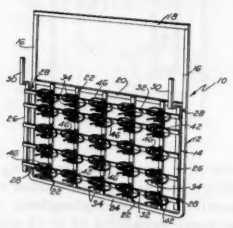
E. said terminal anode and cathode assemblies being connected to an electrical source.

4. The cell according to claim 3 wherein a central wall is positioned intermediate the side walls of the chamber and divides the chamber into a circulation area and an electrode assembly area, a portion of the central wall adjacent the bottom wall of the chamber being open to permit circulation of the solution through the entire cell chamber.

3,864,238
MEANS FOR ELECTROPOLISHING DENTURE FRAMES

Samuel Nash, 50 Althea Drive, Cranston, R.I. 02920, and Melvin Nash, 825 Pontiac Ave., Cranston, R.I. 02910

Filed Mar. 30, 1973, Ser. No. 346,579
Int. Cl. C23b *5/70*
U.S. Cl. 204—297 W 4 Claims



1. A rack for electrochemically polishing dentures comprising a rear frame portion, a front frame portion dielectrically mounted in spaced relation in front of said rear frame portion, said rear frame portion having spaced vertical strips, said front frame portion having spaced horizontal strips, means on said vertical strips at the intersection of said strips for holding a denture in position for electropolishing, said means comprising a pair of stiff, resilient, titanium arms extending outwardly in a V-shape, said arms having an integral apex held to said vertical strip by a titanium bolt, said arms having holding notches adjacent their free ends, and a soft lead wire mounted on said horizontal strip and bendable around a denture in said holding means in spaced relation to the denture.

3,864,239
MULTITARGET SEQUENTIAL SPUTTERING APPARATUS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Rindge Shima, 1344 Franklin St., Santa Monica, Calif. 90404

Filed Apr. 22, 1974, Ser. No. 462,705
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 15 Claims

1. A sputtering apparatus comprising:

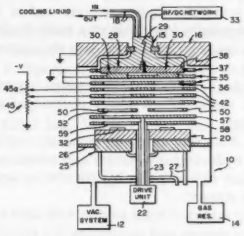
a chamber for containing an inert gas at a selected pressure;

a single stationary cathode in said chamber said cathode having means to support a plurality of different target materials connected thereto;

a rotatable anode in said chamber spaced apart from said cathode along a chamber axis and having selected area means for supporting a plurality of substrates;

a plurality of spaced apart elements supported between said anode and said cathode, each element defining a plurality of apertures, whereby each of said targets is exposable through a different set of apertures of said plates to a selected area of said anode aligned with the target-material along a different axis parallel to said chamber axis;

power means for applying a potential difference across said anode and cathode to ionize said gas to form plasma containing gas ions and electrons, said ions striking said targets to dislodge neutral material particles therefrom, at least some of which are directed to said anode;



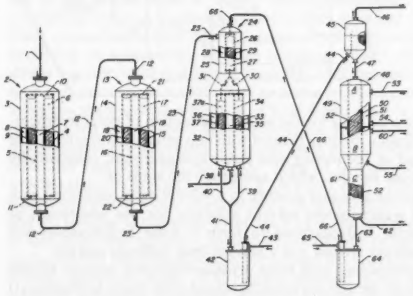
potential means for controlling the potentials of said elements so as to control the ionization current of each plasma between each target and directed to said anode through a different set of apertures of said elements, said plates and apertures being spaced between said anode and cathode whereby when the selected area of said anode is aligned with a first of said targets only neutral material particles from said first target reach said selected area, with neutral material particles from either or both said first and second elements reaching said selected anode area continuously as said anode is rotated and the selected anode area is moved from alignment with said first target to alignment with said second target.

3,864,240

INTEGRATION OF A REACTION SYSTEM HAVING GRAVITY-FLOWING CATALYST PARTICLES WITH A FIXED-BED SYSTEM

Richard D. Stone, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 9, 1973, Ser. No. 339,820
Int. Cl. C10g *35/04, 35/08*
U.S. Cl. 208—64 **5 Claims**



1. A multiple-stage process for the catalytic reforming of a hydrocarbon feed stream which comprises the steps of:

a. reacting said feed stream in a plurality of fixed-bed, catalytic first reaction zones, said feed stream contacting said fixed-bed catalysts in lateral, radial flow, said fixed beds being in series flow with each other;

b. introducing at least a portion of the resulting first zone effluent downwardly into a second reaction zone containing a bed of catalyst movable downwardly therethrough via gravity-flow, and further reacting said effluent in contact with said movable catalyst;

c. withdrawing, at least periodically, catalyst from said second reaction zone, while simultaneously recovering converted hydrocarbon effluent therefrom; and,

d. at least periodically adding fresh, or regenerated catalyst to said second reaction zone.

3,864,241

BIMETALLIC CATALYTIC REFORMING WITH WATER ADDITION

Richard E. Rausch, Mundflein, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 187,579, Oct. 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 807,910, March 17, 1969, Pat. No. 3,740,328. This application Oct. 12, 1973, Ser. No. 406,134The portion of the term of this patent subsequent to July 10, 1990, has been disclaimed.
Int. Cl. C10g *35/08*
U.S. Cl. 208—139 **17 Claims**

1. A process for catalytically reforming a gasoline fraction, which process comprises continuously introducing a gasoline fraction, a hydrogen stream and water or a water-producing substance into a reforming zone and therein contacting the resulting mixture at reforming conditions with catalytic composite comprising a combination of a platinum group component, a tin component and a halogen component with a porous carrier material, wherein the components are present in amounts sufficient to result in the composite containing, on an elemental basis, about 0.01 to about 2 wt. percent platinum group metal, about 0.01 to about 5 wt. percent tin and about 0.01 to about 3.5 wt. percent halogen, wherein the tin component is uniformly dispersed throughout the porous carrier material in a particle size of less than 100 A. in maximum dimension, wherein substantially all of the platinum group component is present in the composite as an elemental metal, wherein substantially all of the tin component is present in the composite in an oxidation state above that of the elemental metal and wherein the total amount of water or water-producing substance introduced into said zone continuously corresponds to about 10 to about 50 wt. ppm. of the gasoline fraction, calculated on the basis of equivalent water.

3,864,242

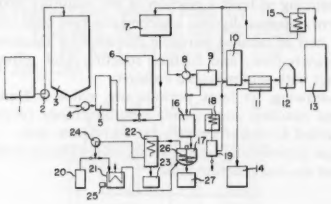
TREATING MUDDY-LIKE WASTE OILY MATERIAL

Shichie Watanabe, Fukuoka, Japan, assignor to Kabushiki Kaisha Imamura Seisakusho, Wakamatsu-Ku, Kitakyushu, Japan

Filed Dec. 13, 1973, Ser. No. 426,725
Int. Cl. C10g *27/100*
U.S. Cl. 208—180 **5 Claims**

1. A process for treating muddy-like waste oily materials characterized by comprising a first step of settling and separating the muddy-like oily material layer and a layer containing water and a solid material in a settling tank while maintaining a temperature of the said tank to 50°–70°C.; the second step of conditioning the pH of the said muddy-like oily material to 2–4; the third step of extracting a low sulfur containing fuel oil from the said muddy-like oily material coming from the second step with a paraffin base saturated hydrocarbon having a boiling point of 30°– 250°C. in an extracting tower while maintaining a temperature of 5°–25°C.; a fourth step of centrifuging the said muddy-like oil material coming from the third step to separate the low sulfur containing fuel oil fraction containing the said paraffin base saturated hydrocarbon and

an asphalt base sludge which is discarded as a coke-like sludge not containing any oil material after dry-distillating the said asphalt base sludge at a temperature of 500°–600° C. in a



sludge dry distillating still, and a fifth step of fractionally distillating the said paraffin base saturated hydrocarbon from the said low sulfur containing fuel oil fraction to produce the said low sulfur containing fuel oil.

3,864,243

REMOVAL OF CHEMICALLY COMBINED CHLORINE AND OTHER IMPURITIES FROM HYDROCARBONS

Robert E. Reusser; Bruce C. Benedict, and Homer J. Sarrett, Jr., all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 9, 1973, Ser. No. 349,182
Int. Cl. C07c 7/12
U.S. Cl. 208—262 **7 Claims**

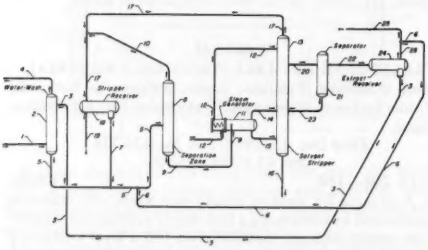
1. A method for treating hydrocarbons containing impurities comprising chemically combined chlorine consisting essentially of organically combined chlorine to remove said organically combined chlorine, said method comprising contacting said hydrocarbons with an amount of high surface area, porous alumina for a time sufficient, at ambient temperature, to adsorb said chemically combined chlorine onto said alumina.

3,864,244

SOLVENT EXTRACTION WITH INTERNAL PREPARATION OF STRIPPING STEAM

Harry M. Van Tassell, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plains, Ill.

Filed Nov. 23, 1973, Ser. No. 418,698
Int. Cl. C10g 21/28
U.S. Cl. 208—321 **8 Claims**



1. In a process for the recovery of polar hydrocarbons from a mixture thereof with non-polar hydrocarbons, wherein:
   i. said mixture is contacted with a water-soluble, oxygen-containing solvent, selective for the extraction of said polar hydrocarbons;
   ii. there is recovered an extract stream containing polar hydrocarbons and a major proportion of said water-soluble solvent, and a raffinate stream containing non-polar hydrocarbons and a minor proportion of said water-soluble solvent;
   iii. said raffinate stream is contacted with water to recover said solvent and to provide a hydrocarbon concentrate substantially free from said solvent; and,
   iv. said extract stream is contacted with steam, in a solvent stripping zone, to remove hydrocarbons from said water-soluble solvent and to recover substantially solvent-free polar hydrocarbons;

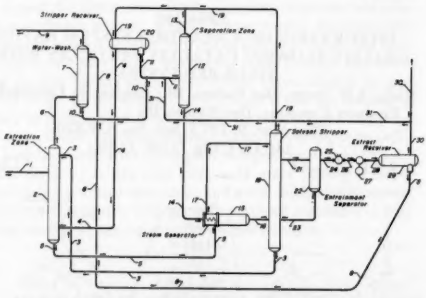
the method of internally preparing steam, for use in said solvent stripping zone, substantially free from non-polar hydrocarbons, which method comprises the steps of:
   a. contacting said raffinate stream with a first water stream to provide a second raffinate stream, substantially free from solvent, and a second water stream containing solvent and a minor quantity of non-polar hydrocarbons;
   b. admixing said second water stream with a first polar hydrocarbon-rich stream and separating the resulting mixture to provide a second polar hydrocarbon stream containing non-polar hydrocarbons and a third water stream substantially free from non-polar hydrocarbons;
   c. introducing said extract stream into the upper portion of said solvent stripping zone;
   d. generating steam from said third water stream and introducing said steam into a lower portion of said solvent stripping zone;
   e. recovering, from said stripping zone, an overhead stream comprising hydrocarbons, steam and solvent, an aqueous extract stream rich in polar hydrocarbons and a bottoms solvent-rich stream;
   f. commingling said overhead stream with said second polar hydrocarbon stream and separating the resulting mixture to provide a fourth water stream and a hydrocarbon-rich stream; and
   g. commingling said fourth water stream with said second water stream and said first polar hydrocarbon-rich stream.

3,864,245

SOLVENT EXTRACTION WITH INCREASED POLAR HYDROCARBON PURITY

Harry M. Van Tassell, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 23, 1973, Ser. No. 418,699
Int. Cl. C10g 21/28
U.S. Cl. 208—321 **11 Claims**



1. In a process for the solvent extraction of polar hydrocarbons from a mixture thereof with non-polar hydrocarbons, the method of recovering said polar hydrocarbons, substantially free from solvent, which comprises the steps of:
   a. contacting said mixture in a solvent extraction zone with a water-soluble solvent selective for the adsorption of polar hydrocarbons to form a polar hydrocarbon-rich solvent stream and a solvent-lean raffinate stream;
   b. contacting said polar hydrocarbon-rich solvent stream from the solvent extraction zone with steam to provide (i) a first solvent concentrate substantially free from polar hydrocarbons, (ii) a vaporous stream containing steam, solvent and hydrocarbons and (iii) a vaporous first polar

hydrocarbon concentrate of reduced solvent content, and containing steam;

c. separating said first polar hydrocarbon concentrate, in a first separation zone, to provide (i) a second solvent-rich stream and (ii) a vaporous second polar hydrocarbon concentrate of reduced solvent content, and containing steam;

d. passing said second polar hydrocarbon concentrate through a zone of turbulence at a temperature of about 60°F. to about 180°F.; and,

e. separating the resulting turbulent polar hydrocarbon concentrate, in a second separation zone, to provide (i) a water concentrate, containing solvent, and (ii) a third polar hydrocarbon concentrate substantially free from solvent.

3,864,246

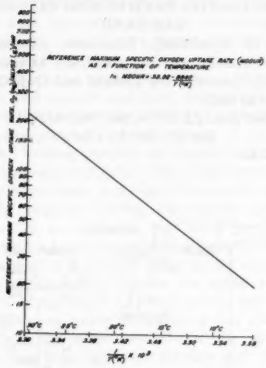
NON-BULKING ACTIVATED SLUDGE PROCESS

Jeremiah P. Casey; Curtis S. McDowell, both of Macungie, Pa.; Marshall L. Spector, Belle Mead, N.J., and Alan J. Zupko, Malvern, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 24, 1973, Ser. No. 326,377

Int. Cl. C02c *1/06*

U.S. Cl. 210—7 **5 Claims**



1. In the operation of an activated sludge system having at least two successive aeration stages, the method of inhibiting proliferation of filamentous biomass which comprises: aerating in an initial stage a mixed liquor comprising BOD-containing aqueous waste in admixture with activated sludge while controlling at least one variable selected from the group consisting of initial stage influent residence time, activated sludge recycle rate, and initial stage MLVSS concentration such that the ratio of soluble food to active biomass as determined by the expression F_a/M_a is at least 4 and there is maintained in the mixed liquor during said initial stage a dissolved oxygen content numerically equal in parts per million to at least 2 or one-tenth the numerical value of the ratio F_a/M_a, whichever is the greater, wherein F_a is equal to 1.5 times the weight of soluble BOD_5 charged per day to the mixed liquor and M_a is equal to the quantity of MLVSS in the mixed liquor in said stage multiplied by an activity coefficient determined by the ratio of the maximum specific oxygen uptake rate of the volatile suspended solids (VSS) under aeration to the predetermined reference maximum specific oxygen uptake rate MSOUR for the same temperature, MSOUR being determined by the equation:

$$ln\ MSOUOR = 33.92 - 8640/T(°K).$$

3,864,247

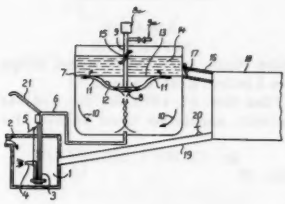
BIOLOGICAL DECOMPOSITION OF ORGANIC MATERIAL BY THERMOPHILIC MICROORGANISMS

Hubert K. E. Fuchs, Mayen, Germany, assignor to The De Laval Separator Company, Poughkeepsie, N.Y.

Continuation-in-part of Ser. No. 128,097, March 25, 1971, Pat. No. 3,745,113. This application Aug. 23, 1972, Ser. No. 282,980

Int. Cl. C02c *1/02*

U.S. Cl. 210—12 **1 Claim**



1. A method for biologically decomposing organic material by means of thermophilic microorganisms, said method comprising the steps of supplying to a treatment vessel an aqueous liquid containing organic material and having a biologic oxygen demand during five days of at least 1,500 mg of oxygen gas per liter of liquid, intimately contacting the liquid in said vessel, and in the presence of thermophilic microorganisms, with oxygen in a quantity corresponding to at least 1.1 times and at most 6 times the quantity of oxygen which theoretically can be consumed by the organic material by means of the thermophilic microorganisms, and during said contacting step, and without heat addition, maintaining the liquid heat-insulated and heated to a temperature of at least 42° C by the heat-producing activity of the thermophilic microorganisms, the liquid at the start of the biologic decomposition being heated by the activity of mesophilic microorganisms to said temperature of at least 42° C where the thermophilic microorganisms are active.

3,864,248

PRESSURE MODULATOR FOR AN ARTIFICIAL BLOOD CIRCUIT

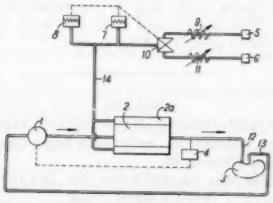
Alain Granger; Jean Lissot, both of Seine et Marne, and Andre Sausse, Hauts-de-Seine, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Apr. 13, 1972, Ser. No. 243,658

Claims priority, application France, Apr. 13, 1971, 71.12959

Int. Cl. B01d *13/00*

U.S. Cl. 210—19 **6 Claims**



1. A pressure modulator for an artificial blood circuit, said modulator comprising, in combination:

a. at least one resilient wall defining part of a blood chamber;

b. an inlet duct and an outlet duct for said blood chamber;

c. a pair of substantially rigid plates arranged one on

either side of said blood chamber, and forming part of said rigid blood exchanger;

d. at least one pulsation chamber disposed on the side of at least one of said plates remote from said blood chamber; and

e. a fluid pulse generator connected to said at least one pulsation chamber, effective to cause slight flexing of said substantially rigid plates and thereby pulsing of liquid in said blood chamber, according to a time/pressure curve which is very close to the physiological curve at a peripheral artery.

3,864,249

SEPARATOR

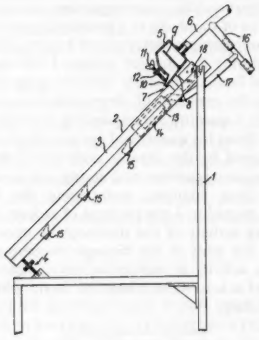
James William Wallis, Rochester, England, assignor to Wallis Separators Limited, Kent, England

Filed Mar. 14, 1973, Ser. No. 340,944

Claims priority, application Great Britain, Mar. 24, 1972, 013884/72

Int. Cl. 209 *1*; **B01d** *35/20*

U.S. Cl. 210—19 **22 Claims**



1. A separator for effecting separation of solid materials from liquids which comprises a filter screen, means for directing a mixture of a solid material and a liquid into contact with the filter screen and means for subjecting the filter screen to acoustic pressure waves comprising an acoustic pressure wave transducer arranged close to but not touching the filter screen so that in operation liquid passing through the screen couples acoustic pressure waves from the transducer to the screen, the arrangement being such that in operation liquid passes through the filter screen and solid materials are retained thereon and travel along the filter screen.

3,864,250

LIQUID-SOLID ADSORPTION CHROMATOGRAPHY

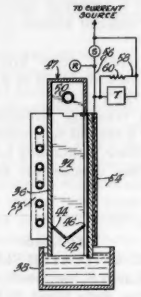
John A. Perry, Chicago, Ill., assignor to Regis Chemical Company, Morton Groove, Ill.

Filed Mar. 16, 1973, Ser. No. 342,195

Int. Cl. B01d *15/08*

U.S. Cl. 210—31 C **44 Claims**

1. A process of performing an analysis on a material by thin layer chromatography comprising the steps of depositing a sample of said material upon a surface having a thin adsorbent layer, partially immersing said surface in a reservoir with said sample being located above the level of said liquid, allowing the liquid to advance through said adsorbent by capillary forces, and during such advance, varying the temperature of the liquid in said adsorbent by the application of heat,



whereby to increase the diffusivity of said material in said liquid and to increase the speed of liquid advance.

3,864,251

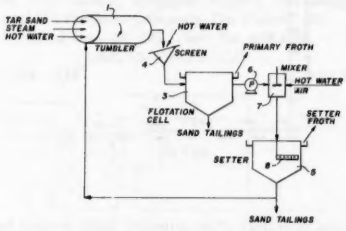
TREATMENT OF MIDDLINGS STREAM FROM HOT WATER PROCESS FOR RECOVERING BITUMEN FROM TAR SAND

Lubomyr M. O. Cymbalisty, Edmonton, Alberta, Canada, assignor to Canada-Cities Service, Ltd.; Atlantic Richfield Canada, Ltd.; Imperial Oil Limited and Gulf Oil Canada, part interest to each

Filed Jan. 22, 1974, Ser. No. 435,515

Int. Cl. B01d *21/00*

U.S. Cl. 210—44 **3 Claims**



1. In a continuous process for recovering bitumen from tar sand comprising combining the tar sand with air and hot water in a tumbler to disintegrate the tar sand and produce a hot slurry, diluting the slurry with water, introducing the dilute slurry into a separation cell wherein coarse solids settle out to form a tailings product, aerated bitumen rises to the surface of the cell contents and forms a froth product, and a middlings stream is withdrawn from the cell, said stream comprising bitumen, fine solids and water, the improvement which comprises:

diluting the middlings stream with hot water; and

introducing the diluted middlings stream into a settler vessel and holding it therein for a sufficient period of time to allow the major portion of the bitumen in the stream to rise to the surface of the vessel contents and form a froth product;

withdrawing the froth product; and

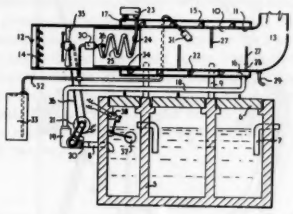
withdrawing a tailings stream from the base of the vessel, said tailings stream comprising the major portion of the fine solids and water introduced into the vessel.

3,864,252

METHOD OF APPARATUS FOR TREATING SEWAGE

Albert Z. Morin, and Thomas H. Boyd, both of North Bay, Ontario, Canada, assignors to Trans-Continental Purification Research and Development Ltd., North Bay, Ontario, Canada

Filed Apr. 4, 1973, Ser. No. 347,800
Int. Cl. C02b 1/18
U.S. Cl. 210—59 5 Claims



1. A method of treating clear run-off from a septic tank, separating unit, lagoon, or the like comprising the steps of heating the liquid waste to a high temperature near 212°F producing steam and water vapour, spraying such steam and water vapour into an open flame to raise the temperature of said steam and vapour and burn any volatile combustibles therein, and releasing at least some of said steam, water vapour and the products of combustion to the atmosphere, wherein the heating consists of initially warming the liquid waste and subsequently raising the temperature thereof in the area of the open flame to a high temperature near 212°F and wherein the steps of heating, evaporating and burning are carried out in an enclosed elongated horizontal passage through which a forced air stream is passed from an open air inlet at one end to a vertical outlet to the atmosphere at the other end, characterized in that the initial warming of the liquid waste is produced by progressively moving said liquid waste in a heating jacket surrounding said passage and in a direction from the outlet end toward the inlet end of said passage and in heat exchange relation with said passage in which the burning is carried out and the subsequent raising of the temperature of said liquid waste to a high temperature near 212°F is obtained by moving said liquid waste in a direction leading toward the air inlet end of said passage and in a feeding coil in the immediate vicinity of the open flame where the direction of travel of said liquid waste is reversed so it is sprayed into the flame in a direction leading toward the outlet end of said passage.

3,864,253

SLIME CONTROL COMPOSITIONS AND THEIR USE

Bernard F. Shema, Glenside; Robert H. Brink, Jr., Doylestown, and Paul Swered, Philadelphia, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed June 28, 1973, Ser. No. 374,279
Int. Cl. A01n 9/20; C02b 3/06
U.S. Cl. 210—62 8 Claims

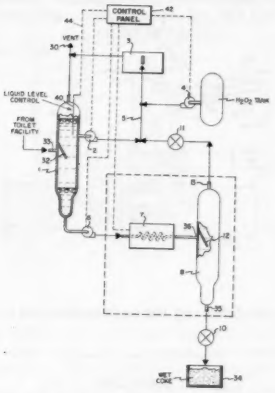
3. A method for controlling the growth of the microorganism Aerobacter aerogenes in an aqueous system which comprises adding to said system an effective amount of a composition comprised of 2,2-dibromo-3-nitrilopropionamide and sodium linear dodecyl benzene sulfonate, as 35 percent solution, wherein the weight ratio of the amide to the sulfonate ranges from about 5:95 to about 95:5 respectively.

3,864,254

SEWAGE TREATMENT UNIT

Howard V. Hess, Glenham; William F. Franz, Gardiner, and Edward L. Cole, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 28, 1973, Ser. No. 345,637
Int. Cl. C02b 1/02, 3/08
U.S. Cl. 210—63 2 Claims



1. A process for treating aqueous waste sewage comprising conveying said sewage to a primary settling zone; separating liquid from solid wastes; flowing said liquid to a water storage and treating zone and synchronously supplying hydrogen peroxide to said liquid, coking said solid waste under a pressue of about 500 to 3000 psig at a temperature between about 550°F and 750°F to form coke and a liquid effluent; separating said coke from said effluent; recycling said effluent to said water storage and treating zone and periodically treating said effluent with hydrogen peroxide as said effluent passes to said zone.

3,864,255

SOLIDS SEPARATION SYSTEM

Roger Swanson, Wayne, Ill., assignor to Babson Brothers Company, Oak Brook, Ill.

Filed Sept. 15, 1972, Ser. No. 289,268
Int. Cl. B01d 37/00
U.S. Cl. 210—67 4 Claims

4. A method for separating grass from liquid manure which comprises

delivering the liquid manure to a holding zone,

directing the liquid manure from the holding zone to a primary separation zone and screening solid grass from said manure in said primary separation zone while washing the manure with water,

delivering the grass from said primary separation zone to a secondary separation zone,

squeezing said grass in said secondary separation zone with sufficient force to break capillaries in the grass and further reduce the moisture content of the grass,

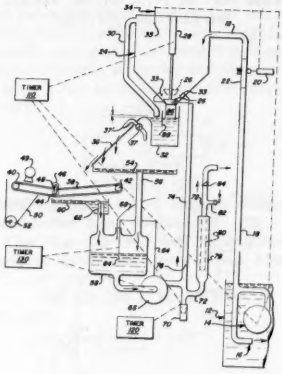
recovering liquid from said primary and secondary separation zone as fractions separate from said grass,

recycling at least a portion of the recovered liquid as washing liquid to said holding zone,

delivering a portion of the recovered liquid as effluent from the system, and

filtering the effluent in a vertical discharge pipe as it is discharged from the system, then venting the discharge

pipe above the filter whereby the liquid in the discharge pipe flows back through the filter and backwashes the



same, and delivering the backwash liquid to the holding tank.

3,864,256

FILTER CENTRIFUGE AND METHOD OF OPERATING SAME

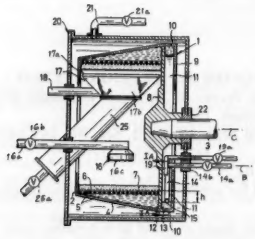
Gunther Hultsch; Kurt Zeppenfeld; Peter Niedner, and Peter Ostermeyer, all of Munich, Germany, assignors to Krauss-Maffer Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 423,579, Dec. 10, 1973. This application June 17, 1974, Ser. No. 480,159

Claims priority, application Germany, June 19, 1973, 2331196

Int. Cl. B01d *21/26*

U.S. Cl. 210—78 **14 Claims**



1. A filter centrifuge comprising:

a housing;

a drum rotatable in said housing and formed with a support for a filter medium centered on the axis of rotation of the drum and adapted to accumulate a filter cake upon introduction of a suspension of solids in a liquid phase into said drum;

means forming a liquid-collecting compartment outwardly of said filter medium in said drum and provided with at least one outlet radially outward of said filter medium; and

pump means including a venturi in said drum having a suction conduit opening into said compartment at a location radially inward of said outlet for sucking air from said compartment.

3,864,257

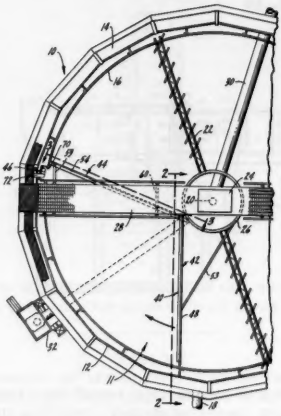
METHOD AND APPARATUS FOR SURFACE SKIMMING

Robert L. Shaffer, Olathe, Kans., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Sept. 17, 1973, Ser. No. 398,289

Int. Cl. B01d *21/00*

U.S. Cl. 210—83 **8 Claims**



1. In combination with a circular tank adapted to receive liquid, means for removing floating matter from the surface of the liquid, said means comprising:

a. a surface skimming arm positioned within said tank for rotation about a centrally disposed vertical axis so as to push the floating matter ahead of it; and

b. an anti-rotation arm radially affixed within said tank, said skimming arm and said anti-rotation arm forming a wedge therebetween which becomes smaller and moves outward as said skimming arm approaches said anti-rotation arm so as to direct said floating matter trapped therein outward towards the periphery of said tank.

3,864,258

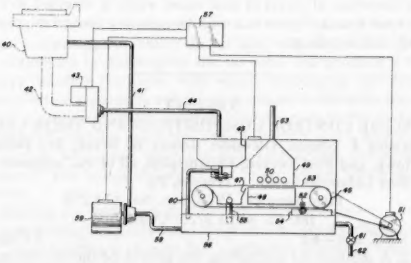
APPARATUS FOR TREATING SEWAGE

John M. Richardson, Key Largo, Fla., and George W. Reid, Norman, Okla., assignors to RSC Industries,Inc., Opa-Locka, Fla.

Filed Mar. 26, 1973, Ser. No. 344,766

Int. Cl. B01d *33/14*; **C02b** *3/04*

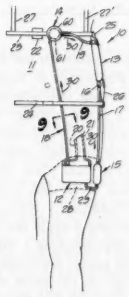
U.S. Cl. 210—85 **4 Claims**



1. A self contained, non-contaminating waste disposal system, comprising a toilet for waste matter, a macerator pump receiving sid waste matter, conduit means to said macerator pump for conveying comminuted waste produced and terminating in a distributor means, a movable endless and porous

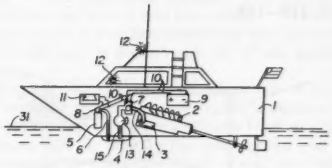
belt below said distributor means for separating solids and liquids of controlled particle size, a sump for receiving said separated liquids, a thermal destruction chamber directly adjacent to said distributor means, said porous belt extending through said destruction chamber, means for moving said porous belt to carry said solids through said thermal destruction chamber, means for heating said thermal destruction chamber by radiant heat for subjecting said solids to high temperature oxidation at temperatures in the range of 900° to 1,800°F. to convert said solids to an inert ash in the thermal destruction chamber, means for exhausting thermally destructed gases from said thermal destruction chamber externally to the atmosphere, means for removing said ash from the thermal destruction chamber to an external receptacle, means for cleaning said porous belt, reservoir means for receiving said separated liquid from said sump, means for evaporating excess liquid, means for disinfecting said separated liquids, means for recycling separated liquid from the reservoir means for flushing the toilet, means for controlling the level in said reservoir means, and means for adding makeup water to said reservoir means.

3,864,259
AMBULATORY HEMODIALYSIS APPARATUS
Earle E. Newhart, 1815 Galatea E. Ter., Corona Del Mar, Calif. 92625
Filed Aug. 16, 1972, Ser. No. 281,183
Int. Cl. B01d *31/00, 13/00*
U.S. Cl. 210—88 **10 Claims**



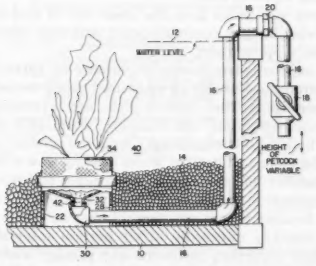
1. An ambulatory self contained hemodialysis apparatus, in combination comprising:
an ambulatory hemodialysis perfusion unit having equal length multiple small internal diameter dialysis tubules disposed in an opposed pair of header plates, said header plates secured in the interior of a rigid boundary case in a fluid exchanger configuration, said boundary case having a pair of opposed dialysate conduits secured thereto and a pair of blood conduits manifolded to said opposed pair of header plates;
an ambulatory dialysate reservoir having each one of an opposed pair of reservoir conduits secured to each one of a pair of dialysate tubular conductors, each one of said dialysate tubular conductors separately secured to one of said dialysate conduits, the inlet conduit of said reservoir having a flexible, gravity positionable downspout conductively secured thereto inside said reservoir, the downspout length adapted to provide dialysate circulation in upright or reclining reservoir position, said reservoir having a dialysate additive inlet and addition inlet closure, said reservoir adapted to securing to the body of a patient;
valve means conductively secured to said dialysate tubular conductors providing dialysate unidirectional flow;
an ambulatory pump means conductively secured to said dialysate reservoir, said pump means displacing dialysate in unidirectional flow, said pump means actuated by patient generated pulses; and,
an ambulatory voiding valve conductively secured to said dialysate conduction circuit, providing dialysate removal.

3,864,260
MARINE WATER INLET DEVICE MEANS
Philip M. Banner, 28 Oxford Rd., Massapequa, N.Y. 11758
Filed Mar. 20, 1973, Ser. No. 343,121
Int. Cl. B01d *35/16*
U.S. Cl. 210—108 **15 Claims**



1. A water inlet device adapted for liquids flowing therethrough and subject to becoming clogged comprising an enclosure including a top and a bottom associated therewith, means to connect a pipe to said enclosure, a source of pressurized substance, and means to connect said source to said enclosure and discharging therein to blow out any clogged materal.

3,864,261
AQUARIUM SEDIMENT TRAP
Liebert J. Masterjoseph, Yonkers, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Jan. 14, 1974, Ser. No. 433,078
Int. Cl. B01d *35/02*
U.S. Cl. 210—163 **1 Claim**



1. In combination with an aquarium tank having a suction pipe running along the inside bottom surface, a sediment trap comprising:
a vertical hollow rectangular member open at top and bottom and resting on said inside bottom surface, said member having a side opening in one wall, said pipe extending through said opening with a suction end disposed in the member, said member having a raised vertical periphery surrounding the top thereof;
a container removably disposed in the open top of the member, said container having a surface which extends downwardly and inwardly to a central drain hole, said surface being rectangularly shaped with an X-shaped diagonally disposed gutter centered on said hole;

means securing the suction end of said pipe to the bottom of said drain hole; and

a hollow cover enclosing said container surface and having small openings through which water can be drawn from the tank into the pipe, said cover having a bottom periphery with an outwardly extending lip which is inserted with snap fit into the raised member periphery for engagement therewith.

3,864,262

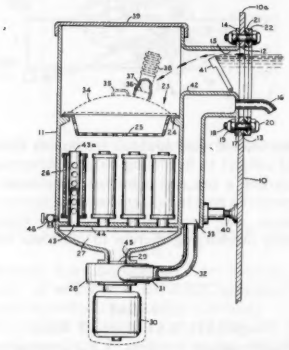
POOL FILTER SYSTEM

Robert S. Lang, and Robert L. Carnot, both of Tampa, Fla., assignors to L. F. Lang & Son Pools, Inc., Tampa, Fla.

Filed Mar. 14, 1973, Ser. No. 341,108

Int. Cl. E04h *3/20*

U.S. Cl. 210—169 **5 Claims**



1. A pool filter system for attachment at a single water level opening in an above-ground pool wall comprising:

a unitary housing having a vertical chamber therein and a horizontal support plate extending across said chamber near its lower end;

a pump suspended from the lower end of said housing and having its inlet communicating with said chamber below said support plate;

said support plate having a plurality of vertical openings therein, a plurality of apertured pipes mounted in said openings in the support plate and extending upward therefrom inside said chamber, a plurality of generally cylindrical filter cartridges mounted on said pipes above said plate to filter the water passing down through said chamber and through said cartridges and pipes and said openings in the support plate into the pump inlet;

said housing at one side thereof near its upper end having a laterally outwardly offset portion integral therewith which presents a horizontal inlet passage leading into said chamber near the latter's upper end and a horizontal discharge passage immediately below said inlet passage, each of said passages being open at the outer end thereof away from said chamber in the housing for registration with said opening in the pool wall;

said housing at said one side thereof having an outer portion thereof which is offset laterally inward from the outer ends of said inlet and discharge passages and defines a vertical pressure chamber located outside said firstmentioned chamber in the housing, said pressure chamber having its lower end connected to the outlet of said pump and having its upper end opening into said discharge passage;

means for sealingly attaching the outer end of said offset portion of the housing to the outside of the pool wall around the single opening therein with the outer ends of said inlet and discharge pasages both registering directly with said opening in the pool wall;

and rigid stand-off means extending laterally outward from said outer portion of the housing at a location thereon substantially below said offset portion of the housing for engagement with said pool wall to space the lower end of the housing rigidly from the pool wall.

3,864,263

CHROMATOGRAPHIC PLATE DEVICE

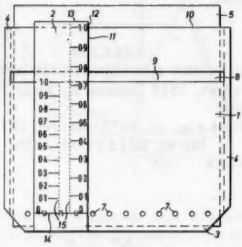
Keshavlal Raghavji Jethwa, Kingston, and Maurice Henry Bennie, Greenhithe, both of England, assignors to The Wellcome Foundation Limited, London, England

Filed Apr. 11, 1973, Ser. No. 349,997

Claims priority, application Great Britain, Apr. 13, 1972, 17051/72; Mar. 7, 1973, 5934/73

Int. Cl. B01d *15/08*

U.S. Cl. 210—198 C **14 Claims**



1. A measuring device suitable for use in thin-layer chromatography which device comprises in combination a substantially transparent plate having two opposed side walls which elevate said plate above a plane surface when placed thereon, a base wall between the side walls to locate a chromatographic sheet when placed beneath the plate, relative to the plate, and a linear array of orifices in said plate adjacent and substantially parallel to the base wall; and a cursor comprising a measuring portion of substantially transparent material slidable on the plate and having a scale for the measurement of Rf values of chemical components in a chromatographic sheet when placed beneath the plate, a locating portion for sliding co-operation with an edge of the plate which lies parallel to the linear array of orifices to enable Rf values to be read and wherein the unit of length is greater than or equal to the length of the run on a chromatographic sheet when used therewith.

3,864,264

APPARATUS FOR THE TERTIARY TREATMENT OF LIQUIDS

Guenter Spohr, Davidsonville, Md., and Vaughan R. Sparham, Bournemouth, England, assignors to Hendrick Manufacturing Company, Carbondale, Pa.

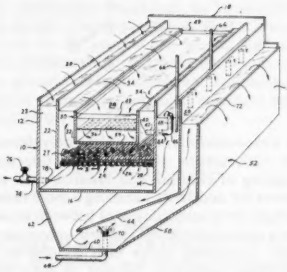
Filed Sept. 6, 1973, Ser. No. 394,815

Int. Cl. C02b *3/08*

U.S. Cl. 210—199 **2 Claims**

1. Unitary apparatus for the treatment of water comprising: a tank in which water to be treated is contacted with a disinfectant, an upflow clarifier mounted within said tank, said clarifier traversed by a foraminous septum, means disposed within said tank and above the base of said tank forming a plenum below and in communication with said septum, said clarifier having wall means surrounding said septum and forming a chamber thereabove, tray means supported by said wall means within said chamber, said tray means having a bottom spaced above said septum and having a wall portion projecting upwardly from said bottom to provide a weir over which water disposed in said chamber may flow to enter said tray means, perforate means spaced above said bottom supporting a down-

flow treatment medium in said tray means whereby water overflowing said weir may trickle downwardly through said medium and through said perforate means into the space under said perforate means, outlet means communicating from said space through said wall means to discharge water from said tray means to said tank, said tank having a partition wall spaced from said wall means, water from said tray means discharged through said outlet means to the space between said partition wall and said wall means, said partition wall extending between opposite sides of said tank, said partition wall spaced above the base of said tank, said tank having an outlet weir, said partition wall spaced from said outlet weir, water received from said tray means flowing downwardly in said tank to one side of said partition wall, and then through the space between said partition wall and the base of said tank



and upwardly in said tank to said outlet weir on the other side of said partition wall, said apparatus further including means to admit a disinfectant to said water discharged from said tray means, standpipe means to receive water to be treated, said standpipe means having communication with said plenum and maintaining a hydraulic head effective to advance said water upwardly through said septum and over said weir for percolation through said treatment medium and descent through said outlet means to said tank, drainage means to drain water from said tank and having communication with said plenum and said standpipe means below the level of said septum, said including valve means operatively connected to and normally closing said drainage means for selectively opening said drainage means to withdraw water disposed below said septum thus to induce a downflow of water through said septum.

3,864,265

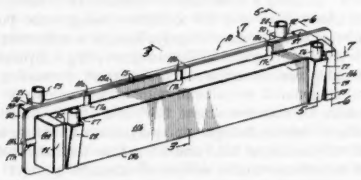
EDGE SEALED FOLDED MEMBRANE

Finley W. Markley, Tustin, Calif., assignor to Galen Laboratories, Inc., Santa Ana, Calif.

Filed June 25, 1973, Ser. No. 373,160

Int. Cl. B01d *31/00*

U.S. Cl. 210—321 **28 Claims**



1. Fluid flow transfer apparatus comprising
a membrane having
first and second surfaces,
first and second end edges,
first and second side edges,
said membrane being folded to form a stack of folds having a first end fold terminating at said first end edge intermediate the sides of a first end of the stack and having a second end fold terminating at said second end edge intermediate the sides of the other end of the stack, said stack including a plurality of fold edges collectively forming opposite sides of the stack,
a case encompassing said stack and including
first and second case sides extending along respective sides of said stack adjacent said end folds,
first and second case ends extending along the respective side edges of te folded membrane,
said case including a plurality of flow ports in said case sides in communication with said first and second membrane surfaces at said fold edges,
a plurality of spacer members positioned between selected folds of said stack in contact with one of said membrane surfaces,
means for positioning a portion of at least one of said end folds including the end edge thereof at a distance from the adjoining case top and at a distance from an adjacent membrane fold to provide first and second end edge sealing spaces on oppostie surfaces of said end fold,
a solidified fluid material within said first and second sealing spaces encapsulating said one end edge, and means for blocking flow of said fluid material from said first and second sealing spaces to said flow ports of said case sides.

3,864,266

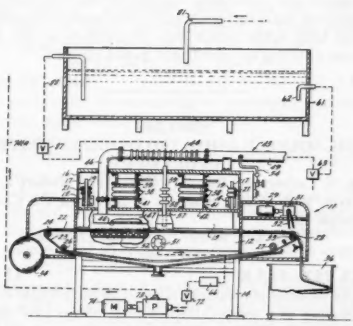
FILTER SYSTEM

Gerald P. Dietrick, 523 Ridgeview Dr., Florence, Ky. 41042

Filed May 11, 1973, Ser. No. 359,310

Int. Cl. B01d *29/02*

U.S. Cl. 210—329 **5 Claims**



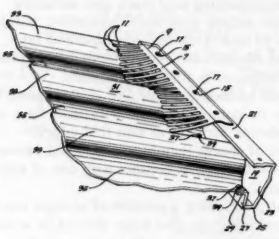
1. In combination with a pair of filters each including a filter strip and hollow upper and lower shells for forming an enclosure surrounding a section of the filter strip, a liquid storage tank, inlet conduit means connecting the tank alternately to the upper shells to supply liquid to the upper shells, an outlet conduit connected to each lower shell, a pair of enclosed prime tanks, there being an upright weir in each prime tank dividing the prime tank into two sections, each outlet conduit discharging into one of the sections of one of the prime tanks, a prime tank discharge line, means for alternately connecting the prime tank discharge line to the other section of each prime tank below an upper edge of the weir, a pump connected to the prime tank discharge line to draw liquid from the prime tanks, a jet ejector connected to an upper portion of each prime tank, and means for directing liquid from the pump through the ejectors to power the ejectors to draw fluid from the upper portions of the prime tanks.

3,864,267

GUTTER FILTER FOR CORRUGATED ROOF SURFACES

Clarence Nelems, 908 S. Wildrose, Brea, Calif. 92621

Filed Oct. 26, 1973, Ser. No. 409,963
Int. Cl. B01d *23/00*
U.S. Cl. 210—474 5 Claims



1. A gutterfilter for the end frame gutter channel of a corrugated roof surface wherein said gutter channel has a flat surface extending above the roof surface adjacent the edge thereof, said filter comprising:

an elongated base member for connection to the flat surface of the end frame gutter of a corrugated roof surface; and a multiplicity of flexible tines attached to said base member, said tines extending outwardly at an angle from said base member to bias the tips of said tines against the corrugated roof, said tips being misaligned to engage and contact the undulating surface of the corrugated roof adjacent the end frame gutter in a manner to intercept and hold debris which may accumulate on the surface from entering the end frame gutter channel.

3,864,268

OIL-SOLUBLE AMINATED OXIDIZED OLEFIN COPOLYMERS

George S. Culbertson, Downers Grove, and Robert E. Karll, Batavia, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Aug. 8, 1972, Ser. No. 278,720
Int. Cl. C10m *1/32*
U.S. Cl. 252—51.5 R 12 Claims

1. The oil-soluble product prepared by the process comprising, reacting at a temperature of from about 140° to about 350°F. an oxidized high molecular weight amorphous copolymer of essentially ethylene and propylene, said copolymer having a number average molecular weight of at least about 1,500, and at least 150 pendant methyl groups per 1,000 chain carbon atoms, with a primary or secondary aliphatic amine selected from the group consisting of an alkyl amine having from about 2 to about 12 carbon atoms, an aliphatic diamine of the general formula $H_2N(CH_2)_yNH_2$ wherein y is an integer of from about 3 to about 10, and a polyalkylene polyamine of the general formula

$$HN-(A-N)_xH$$
$$\quad\quad\quad

between about 100° and 200°C. utilizing a mole ratio of dehydrohalogenated polyalkene-maleic anhydride reaction product to alkylene polyamine of between about 1:0.5 and 1:5.

3,864,271
STABILIZED ACIDIC HYDROGEN PEROXIDE SOLUTIONS

Neil J. Stalter, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 4, 1972, Ser. No. 311,976
Int. Cl. C11d *7/08, 7/18, 7/56*
U.S. Cl. 252—99 **23 Claims**

1. An aqueous, acidic, oxidizing solution stabilized against copper ion-catalyzed degradation at temperatures of up to about 90°C. containing about 0.01 to 50 percent hydrogen peroxide by weight, a strong inorganic acid at a concentration of about 0.01 to 50 percent by weight, and a stabilizing amount of a stabilizer selected from the group consisting of adipic acid, glutaric acid, succinic acid, and mixtures thereof. **4.** The solution of claim **3** wherein the stabilizer concentration is about 0.03 to 0.1 percent by weight.

3,864,272
PROCESS FOR MAKING TRANSLUCENT SOAP BARS

Khairy Toma, Romeoville, and Thomas J. Hassapis, Chicago, both of Ill., assignors to Armour-Dial, Inc., Chicago, Ill.

Filed Jan. 12, 1973, Ser. No. 323,131
Int. Cl. C11d *9/26*
U.S. Cl. 252—125 **10 Claims**

1. In a process for the production of translucent soap in which fatty acids are saponified, the resulting soap spray dried, refined and formed into bars, the improvement in which there is added to said soap after the saponifying step and before the soap is subjected to spray drying, polyethylene glycol in an amount of from 1 – 3 percent, said percentages being based on the weight of said soap.

3,864,273
PROCESS FOR RECLAIMING RARE-EARTH PHOSPHORS

Ronald G. Forbes, Kirtland, and Michael Turjanica, Lyndhurst, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 13, 1972, Ser. No. 305,957
Int. Cl. C09k *1/10, 1/14, 1/44*
U.S. Cl. 252—301.4 R **10 Claims**

1. A reclamation process for contaminated rare-earth phosphors to remove zinc sulfide and zinc cadmium sulfide phosphor contaminants which comprises:

a. heating a contaminated europium activated rare-earth phosphor in an oxidizing atmosphere at elevated temperatures in the range between about 300°C and 900°C sufficiently to volatilize the organic binder which is present,

b. slurrying the phosphor in a liquid solution of a soluble hypochlorite compound to convert the sulfide phosphor contaminants to partially soluble oxygen compounds,

c. reacting the partially soluble oxygen compounds with a soluble ammonium compound to completely dissolve said partially soluble oxygen compounds as ammonium complex ions, and

d. physically separating the phosphor from the dissolved products.

3,864,274
METHOD OF PRODUCING HALOPHOSPHATE PHOSPHOR UTILIZING EXTREMELY RAPID PRECIPITATION OF CALCIUM HYDROGEN ORTHOPHOSPHATE

Herman R. Heytmeijer, Whippany, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 27, 1973, Ser. No. 345,173
Int. Cl. C09k *1/36;* **C01b** *25/32*
U.S. Cl. 252—301.4 P **3 Claims**

1. In a method wherein halophosphate phosphor is prepared by precipitating calcium hydrogen orthophosphate di-hydrate, separating said di-hydrate crystals, converting said calcium di-hydrate crystals to anhydrous calcium hydrogen orthophosphate by stirring said di-hydrate crystals in an acid solution, preparing a raw mix containing said anhydrous calcium hydrogen orthophosphate and firing said raw mix to form said halophosphate phosphor; the improvement which comprises:

a. precipitating said di-hydrate crystals by mixing solutions of calcium chloride or calcium nitrate and diammonium phosphate in approximately stoichiometric proportions, the entire amount of both of said solutions being combined in less than 10 seconds to form a thickened mixture having a viscosity of greater than 500 centipoises; and

b. stirring said thickened mixture for at least about four minutes to form a crystalline calcium hydrogen orthophosphate di-hydrate precipitate.

3,864,275
PROCESS FOR ENVELOPING FINE DROPS OF DISPERSED LIQUIDS

Masao Kan, Chigasaki; Hiroshi Hyodo, Tokyo; Hirofusa Matsuoka, Kamakura; Akio Watanabe, Kanagawa, and Shigekazu Enami, Hiratsuka, all of Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 30,963, April 22, 1970, , which is a continuation-in-part of Ser. No. 405,258, Oct. 20, 1964, abandoned. This application Nov. 21, 1972, Ser. No. 308,453
Claims priority, application Japan, Oct. 21, 1963, 38-56555; Dec. 13, 1963, 38-66527; Sept. 9, 1964, 39-51808; Sept. 9, 1964, 39-51809; Sept. 9, 1964, 39-51810
Int. Cl. B01j *13/02;* **B44d** *1/02*
U.S. Cl. 252—316 **2 Claims**

1. A process for encapsulating or enveloping fine drops of a dispersed liquid which comprises

a. preparing

1. a hydrophobic liquid A which is or contains epichlorohydrin as a first substance and

2. a hydrophilic liquid B which is or contains a polyamine selected from the group consisting of tetramethylene diamine, pentamethylene diamine, hexamethylene diamine and an epoxy resin-amine addition compound as a second substance, and

b. dispersing the liquid A, in the form of fine drops, into the liquid B to cause the first and second substances to react at the interface between liquids A and B, thereby causing a polyaddition reaction at the interface of liquids A and B to produce a polyaddition polymerizate which is insoluble in both liquids A and B, whereby fine drops of the dispersed liquid are encapsulated or enveloped by the polymerizate.

3,864,276
LIGNIN DISPERSING AGENTS AND METHOD OF MAKING SAME

Julius Benko, Sillery, and Gilles Daneault, Sainte Foy, both of Quebec, Canada, assignors to Dryden Chemical Limited, Ontario, Calif.

Filed Oct. 2, 1972, Ser. No. 293,898
Int. Cl. B01f *17/50*
U.S. Cl. 252—354 **8 Claims**

1. A dispersant composition consisting essentially of a blend of Kraft liquor solids cross-linked with spent sulphite liquor

solids, said solids being selected from the group consisting of the unfractionated liquor solids and the high molecular weight fractions thereof and said Kraft liquor solids comprising from about 10 percent to about 85 percent of said blend, on a solids weight basis, with said sulphite liquor solids comprising the remainder.

6. A process for improving the dispersant properties of a blend of (1) from about 10 to about 85 percent Kraft liquor solids, on a solids weight basis, and (2) spent sulphite liquor solids comprising the remainder, both said solids being selected from the group consisting of the unfractionated liquor solids and high molecular weight fractions thereof, which comprises subjecting said blend in a 25 to 50 percent w/v aqueous solution to heat treatment at a temperature in the range of about 115°C to 160°C for from 1 to 3 hours.

3,864,277

HARD GRANULAR ACTIVATED CARBON AND PREPARATION FROM A CARBONACEOUS MATERIAL A BINDER AND AN INORGANIC ACTIVATING AGENT

Julius Louis Kovach, Columbus, Ohio, assignor to North American Carbon, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 37,858, May 15, 1970, abandoned. This application Aug. 14, 1972, Ser. No. 280,118

Int. Cl. C01b *31/08*

U.S. Cl. 252—423 **6 Claims**

5. A chemical activation method of manufacturing granular activated carbon comprising the steps of forming a mixture having a consistency permitting the pelleting of granular shaped solid particles, said mixture including a ground raw carbonaceous material possessing an oxygen content of at least approximately 25 percent by weight on a moisture and ash free basis and taken from a group consisting of wood, straw and low rank brown coals, a carbonaceous binder material taken from a group consisting of lignosulphonates and polyvinyl alcohols which are soluble or emulsifiable in water or solutions of phosphoric acid and zinc chloride, and an effective amount of an inorganic activating agent to substantially carbonize and activate said mixture of raw material and binder taken from a group consisting of phosphoric acid and zinc chloride, the amount of said binder material being sufficient to contribute at least approximately 24 percent by weight of the carbon in the initial mixture based upon the total amount of carbon contributed by the raw material and the binder material; forming shaped granular pellets from said mixture and subsequently heat treating said pellets at effective temperature levels to achieve conventional carbonization and activation levels and a ball-pan hardness of the pelleted end product of at least 85 percent.

3,864,278

POLYMERIZATION CATALYST

Gerardus E. La Heij, and Gerrit J. van Amerongen, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 24, 1973, Ser. No. 409,111

Claims priority, application Great Britain, Dec. 4, 1972, 55860/72

Int. Cl. C08d *1/14*

U.S. Cl. 252—429 B **11 Claims**

1. A process for the preparation of a $TiCl_3$-based polymerization catalyst having increased activity which consists essentially of admixing $TiCl_4$, trihydrocarbyl aluminum and ether having the formula R''—O—R', wherein R' and R'' are the same or different alkyl, cycloalkyl, aryl or alkenyl groups, in a molar ration of ether to $TiCl_4$ of from about 0.1 to about 10.0 and in a molar ratio of trihydrocarbyl aluminum to $TiCl_4$ of from about 0.8 to about 1.2, thereafter aging the catalyst mixture thus obtained, and adding from about 0.05 to about 2 moles of a dihydrocarbyl aluminum chloride per atom of titanium to the aged catalyst mixture, prior to being brought into contact with monomer.

3,864,279

TIN-PHOSPHORUS OXIDATIVE DEHYDROGENATION CATALYST

Emory W. Pitzer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 134,880, April 16, 1971, Pat. No. 3,775,508. This application Sept. 6, 1973, Ser. No. 394,835

Int. Cl. B01j *11/82*

U.S. Cl. 252—435 **16 Claims**

1. A method of preparing a catalyst composition consisting essentially of phosphorus, tin, and oxygen, said catalyst composition containing from about 0.1 to about 16 weight percent phosphorus and from about 15 to about 75 weight percent tin which comprises:

1. forming a wet gel catalyst base consisting essentially of at least one tin-containing component and at least one phosphorus-containing component,
2. admixing said wet gel catalyst base with at least one heat-decomposable, heat-volatile, activity-stimulating ammonium salt so that the resulting admixture contains from about 2 to about 20 weight percent of said ammonium salt based on the total weight of said catalyst composition, and
3. calcining said admixture at a temperature in the range of about 800° to about 1,500°F for a time in the range of about 0.1 to about 24 hours to remove said ammonium salt, said ammonium salt being selected from the group consisting of ammonium carbamate, ammonium carbonate, ammonium nitrate, ammonium nitrite, ammonium sulfate, and ammonium salts of carboxylic acids having up to 12 carbon atoms per molecule.

12. A method in accordance with claim 1 wherein said tin-containing component is stannic chloride; said phosphorus-containing component is phosphoric acid; and said ammonium salt is ammonium sulfate.

3,864,280

CATALYST FOR A N-BUTANE OXIDATION TO MALEIC ANHYDRIDE

Ronald A. Schneider, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 263,883, June 19, 1972,. This application Oct. 24, 1972, Ser. No. 298,074

Int. Cl. B01j *11/82*

U.S. Cl. 252—435 **16 Claims**

1. A crystalline phosphorus-vanadium mixed oxide hydrocarbon oxidation catalyst composition containing pentavalent phosphorus, vanadium and oxygen, said vanadium having an average valence in the range from about plus 3.9 to plus 4.6, said oxide having a phosphorus to vanadium atomic ratio in the range from about 0.9–1.8 to 1, and an intrinsic surface area in the range from about 7 to 50 square meters per gram.

3,864,281

PROCESS FOR THE MANUFACTURE OF A DEHALOGENATION CATALYST

Alexander Ohorodnik, Erftstadt Liblar; Klaus Gehrmann; Joachim Hundeck, both of Hurth-Knapsack, and Hermann Vierling, Hurth, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt/Main, Germany

Filed Aug. 13, 1973, Ser. No. 387,755

Claims priority, application Germany, Aug. 17, 1972, 2240466

Int. Cl. B01j *11/08*

U.S. Cl. 252—447 **8 Claims**

1. In the process for the manufacture of a catalyst comprised of a fine-particulate carrier and palladium metal for the partial dehalogenation of di- and/or trichloracetic acids in the presence of hydrogen to produce monochloroacetic acid, wherein the dry porous carrier is impregnated with a palladium salt solution and the palladium absorbed by the carrier is reduced to palladium metal with the use of a suitable reducing agent, the improvement comprising concentrating the

palladium metal exclusively on the surface of a silicic acid or active carbon carrier having a BET-surface area between about 10 and 800 square meters/gram, a volume of pores between about 0.1 and 1.8 milliliters/gram and a mean particle size between about 10 and 800 microns by impregnating and partially saturating the dry, fine-particulate carrier with water; by continuing impregnation until complete saturation of the carrier so pretreated with the necessary quantity of an aqueous palladium salt solution; and by reducing the palladium salt applied to the carrier to palladium in known manner.

3,864,282

ZEOLITIC POROUS REFRACTORY OXIDE PARTICLES

Dean Arthur Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jan. 8, 1973, Ser. No. 321,749
Int. Cl. B01j *11/40*
U.S. Cl. 252—455 Z **6 Claims**

1. The method of reducing the particle size of a zeolitic refractory oxide having a surface area of at least about 100 square meters per gram including the steps of heating said oxide at an average rate of at least about 0.5°F per millisecond to a temperature of at least about 1,000°F over a temperature differential of at least 500°F sufficient to reduce the average particle size of said oxide.

3,864,283

HYDROCARBON CONVERSION CATALYST

Hans U. Schutt, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 19, 1972, Ser. No. 298,920
Int. Cl. B01j *11/40*
U.S. Cl. 252—455 Z **9 Claims**

1. A method of preparing a mixed crystalline aluminosilicate zeolite hydroconversion catalyst which comprises first physically mixing about 10–90%wt of channel pore structure zeolite selected from the group consisting of L-sieve and mordenite with about 90–10%wt of three-dimensional pore structure Y-sieve zeolite, decationizing the zeolites either before or after mixing to reduce the alkali metal content to less than bout 0.5%wt, then incorporating a catalytic amount of a hydrogenation metal component selected from the group consisting of Group VIII and Group VIB metals of the periodic chart into the mixed zeolites and drying and calcining the catalyst.

3,864,284

PLATINUM-TIN CATALYST ON AN ALUMINA CARRIER

Everett Clippinger, San Rafael, and Bernard F. Mulaskey, Fairfax, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 137,440, April 26, 1971, abandoned, which is a division of Ser. No. 55,125, July 15, 1970, Pat. No. 3,631,215, which is a division of Ser. No. 732,588, May 28, 1968, Pat. No. 3,531,543. This application June 1, 1973, Ser. No. 365,938The portion of the term of this patent subsequent to Sept. 29, 1987, has been disclaimed.
Int. Cl. B01j *11/08*
U.S. Cl. 252—466 PT **3 Claims**

1. A catalytic composite useful for producing aromatic hydrocarbons comprising platinum, tin, and alumina carrier and wherein for each 100 parts by weight of alumina, there is 0.05 to 5 parts of platinum and for each atom of platinum, there is from about 0.01 to 3 atoms of tin.

3,864,285

NOVEL ODORANTS

Giuliano Bozzato, Kusnacht, and Mario Pesaro, Zurich, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed June 13, 1972, Ser. No. 262,411
Claims priority, application Switzerland, June 23, 1971, 9148/71
Int. Cl. A61k *7/00*
U.S. Cl. 252—522 **1 Claim**

1. An odorant composition which contains an olfactorily-effective amount of 10-methyl-$\Delta^{1,9}$-octalone-2 and at least one carrier commonly used in odorant compositions.

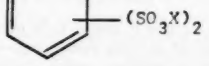
3,864,286

DETERGENT COMPOSITION WITH DISULFONATED CATECHOL AS DETERGENT BUILDER

Robert G. Anderson, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 6, 1972, Ser. No. 304,179
Int. Cl. C11d *1/12*
U.S. Cl. 252—559 **11 Claims**

1. A heavy-duty detergent composition comprising an organic water-soluble anionic, nonionic, ampholytic or zwitterionic detergent-active material and as a builder in an amount sufficient to enhance the detergency of the composition, a salt of a catechol disulfonate having the following formula:



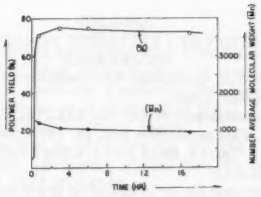
in which X is a water-soluble salt-forming cation, the weight ratio of said detergent-active material to said builder being from about 8 to 1 to 1 to 8.

3,864,287

PROCESS FOR POLYMERIZING TETRAHYDROFURAN

Kazuo Matsuda, Wakayama; Yoshiaki Tanaka, Osaka, and Takeyo Sakai, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1973, Ser. No. 428,668
Claims priority, application Japan, Dec. 29, 1972, 48-2657
Int. Cl. C08g *23/02*
U.S. Cl. 260—2 XA **6 Claims**



1. A process for the polymerization of tetrahydrofuran, which comprises polymerizing tetrahydrofuran in the substantial absence of water and in the presence of (a) from 0.001 to 0.45 moles, per mole of tetrahydrofuran, of acid salt selected from the group consisting of sodium perchlorate, magnesium perchlorate, lithium perchlorate, barium perchlorate, sodium trifluoromethane sulfonate, silver trifluoromethane sulfonate, trifluoromethane sulfonic acid amine salt and mixtures thereof, (b) from 0.005 to 0.5 moles, per mole of tetrahydro-

furan, of organic anhydride selected from the group consisting of acetic anhydride, succinic anhydride, maleic anhydride, orthosulfobenzoic anhydride and mixtures thereof and (c) from 1 to 2 moles, calculated as 100% sulfuric acid, per mole of said acid salt, of sulfuric acid having a concentration of at least 50 wt.%, at a polymerization temperature in the range of from −40° C to +80° C, and then hydrolyzing the terminal groups of the polymer molecules.

3,864,288

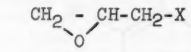
QUATERNIZED POLYEPIHALOHYDRIN THICKENING AGENT

Chang Kiu Riew, Akron, and Robert K. Schlatzer, Jr., Chagrin Falls, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Oct. 15, 1973, Ser. No. 406,234
Int. Cl. C08g *23/20, 25/00*
U.S. Cl. 260—2 A **10 Claims**

1. A crosslinked, quaternized epihalohydrin polymer product prepared by the reaction of

1. an epihalohydrin polymer of molecular weight above about 100,000 consisting of at least 50 percent to 100 percent by weight of polymerized units of an epihalohydrin monomer(s) of the formula



wherein X is Cl, Br, I, or F, and up to 50 percent by weight of polymerized units of an oxide monomer(s) selected from the group consisting of alkylene oxides, cycloaliphatic oxides, glycidyl ethers, glycidyl acrylate, glycidyl methacrylate, allyl glycidyl ether, styrene oxide, and furan, with

2. from about 0.005 to about 0.07 mole of an aliphatic, heterocyclic, aromatic, or alicyclic polyamine, and

3. from about 1 mole to about 5 moles of an aliphatic, heterocyclic, aromatic or alicyclic tertiary monoamine, said moles of polyamine and tertiary monoamine based upon 1 mole equivalent of halogen present on the epihalohydrin polymer.

3,864,289

PREPARATION OF CELLULOSIC SEMI-PERMEABLE MEMBRANES

John L. Rendall, Greenville, S.C., assignor to Koratec, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 132,215, April 7, 1971, abandoned. This application Dec. 19, 1973, Ser. No. 426,133
Int. Cl. B01d *39/14;* **C08g** *21/08*
U.S. Cl. 260—15 **15 Claims**

13. In a process for the preparation of self-supporting cellulosic semi-permeable membranes in which said membranes are cast from a membrane formulation, the improvement comprising casting said membrane from a formulation containing a film forming cellulosic membrane material, a cellulosic cross-liking agent, a catalyst to facilitate cross-linking of said cellulosic membrane, and a chemical blocking agent to facilitate holding open of the polymer molecules within the membrane, and thereafter elevating the temperature of said cast membrane to cause cross-linking to occur and to cure said membrane.

3,864,290

CEMENT SET ACCELERATOR

Richard B. Peppler, and Philip A. Rosskopf, both of South Euclid, Ohio, assignors to Martin Marietta Corporation, New York, N.Y.

Division of Ser. No. 179,240, Sept. 9, 1971, Pat. No. 3,767,436. This application Mar. 23, 1973, Ser. No. 344,149
Int. Cl. C08g *37/32*
U.S. Cl. 260—17.5 **6 Claims**

1. A hydraulic cement mix additive comprising a mixture of (a) a water soluble adduct product resulting from the condensation reaction of 2,4,6-triamino-sym-triazine with an aldehyde under alkaline conditions and (b) an agent adapted to affect the rate of setting of concrete which agent is a lignosulfonate of calcium, sodium or ammonium or a water soluble formate salt, whereby upon incorporating said additive in the hydraulic cement mix of portland cement, aggregate and sufficient water to effect hydraulic setting of the cement, the rate of hardening of said cement mix is advantageously controlled while the amount of water required in the mix for a given consistency is considerably reduced as compared with a plain mix, and without undesired toxic or corrosive effects.

3,864,291

KRAFT OR SODA BLACK LIQUOR ADHESIVE AND PROCEDURE FOR MAKING THE SAME

Terje Ulf Eugen Enkvist, Runebergsgatan 30A, Helsinki, Finland

Filed July 5, 1973, Ser. No. 376,889
Int. Cl. C08g *37/18*
U.S. Cl. 260—17.5 **4 Claims**

1. A process for preparing an adhesive based on black liquor from the pulping industry having a dry matter content of more than 25%, comprising reacting the black liquor with a formaldehyde or cresol to form an adhesive and combining it with a separately prepared phenol-formaldehyde or cresol-formaldehyde adhesive in proportions such that the amount of phenol or cresol used is 15-50% of the sum of the phenol or cresol used and the organic matter of the black liquor.

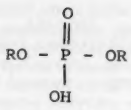
3,864,292

BAKED ALKYD RESIN ENAMEL COATING COMPOSITIONS CROSS-LINKED WITH ETHERIFIED TRIMETHYLOLATED CROTONYLIDENEDIUREA OR ETHERIFIED METHYLOLATED 2,7-DIXO- 4, 5 -DIMETHYL- DECAHYDROPYRIMIDO- (4, 5-D) -PYRIMIDINE

Edward J. Kuzma, Woodbridge, N.J., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 144,270, May 17, 1971, Pat. No. 3,808,039. This application Feb. 4, 1974, Ser. No. 439,467
Int. Cl. C08g *9/24, 37/34;* **C09d** *3/64*
U.S. Cl. 260—21 **1 Claim**

1. A coating compostion adapted for producing baked enamel coatins comprising (1) between about 40 and about 95 per cent by weight of an alkyd resin coating composition; (2) between about 5 and about 60 per cent by weight of an aminoplast selected from the group consisting of etherified trimethylolated crotonylidenediurea and etherified methylolated 2,7-dioxo-4,5-dimethyl-decahydropyrimido-[4,5-d]-pyrimidine, the proportion of components (1) and (2) being based upon the total weight of the alkyd resin and aminoplast; and (3) a catalytically effective amount of amyl acid phosphate having the formula:



wherein R is a hydrogen substituent or an n-amyl subtituent and at least one of said R substituents is n-amyl.

3,864,293

PHOTO-DEGRADABLE STYRENE RESIN COMPOSITION

Hiroshi Miyoshi, Takatsuki, Hirohumi Mori, Suita; Yoriko Tanoue, Suita, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 24, 1971, Ser. No. 174,557

Claims priority, application Japan, Aug. 25, 1970, 45-75053; Dec. 4, 1970, 45-107896; Dec. 28, 1970, 45-126946; Dec. 28, 1970, 45-126947

Int. Cl. C08d *11/00*

U.S. Cl. 260—23.7 R **3 Claims**

1. A photo-degradable styrene resin composition comprising a sytene-diene copolymer of a diene monomer content of from 0.1 to 10 % by weight, wherein said diene is selected from the group consisting of butadiene and isoprene, and, incorporated therein, at least 0.001 parts by weight, per 100 parts by weight of said styrene resin of at least one transition metal salt of an organic carboxylic acid, said transition metal being selected from the group consisting of iron, cobalt, manganese and copper and further including, as a photo-degrading accelerator, at least 0.01 parts by weight, per 100 parts by weight of said styrene resin of at least one brominated aliphatic hydrocarbon which contains at least one carbon atom to which at least two bromine atoms are bonded.

3,864,294

GELLED COATING COMPOSITIONS AND METHOD OF MAKING SAME

Francis W. Busch, Jr., Clinton, Ohio, assignor to Chesebrough-Pond's, Inc., Greenwich

Filed Nov. 2, 1972, Ser. No. 303,084

Int. Cl. C08c *11/70;* **C08f** *45/52;* **C09d** *11/12;* **C08h** *9/06;* **A61k** *7/04*

U.S. Cl. 260—28.5 A **10 Claims**

1. A coating composition in the form of a gel capable of being broken up for application to a suitable substrate by a relatively small shearing force at a relatively small shearing rate comprising a rheological control system comprising an amine-modified montmorillonite clay, a swelling agent therefor which is a phosphoric acid, a non-volatile oleaginous wetting agent having polar groups and an affinity for wetting the clay and a solvent system.

3,864,295

FORMING SYNTHETIC MATERIAL WITH GLYCERYL TRIMONTANATE AS A LUBRICANT

Jean Boussely, Paris, France, assignor to Societe Sapchim-Fournier-Cimag, Paris, France

Filed Mar. 11, 1974, Ser. No. 450,085

Int. Cl. C08f *45/36, 45/52;* **C10m** *3/20*

U.S. Cl. 260—28.5 D **8 Claims**

1. A method of forming a mass of synthetic material selected from the group consisting of polyvinyl chloride and vinyl copolymer, comprising admixing with said material a small but effective amount of glyceryl trimontanate as a lubricant, and thereafter contacting said mass with a solid member to impart a desired form to said mass, said amount being effective to increase the time during which said mass can be in contact with said member without sticking to said member.

3,864,296

AQUEOUS PRINTING FLUIDS FOR PAPER

Robert W. Faessinger, Media, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation-in-part of Ser. Nos. 424,221, Jan. 8, 1965, abandoned, and Ser. No. 424,223, Jan. 8, 1965, abandoned, and Ser. No. 424,224, Jan. 8, 1965, abandoned, and Ser. No. 424,225, Jan. 8, 1965, abandoned. This application Feb. 28, 1967, Ser. No. 619,210

Int. Cl. C08g *51/24, 51/66*

U.S. Cl. 260—29.2 N **33 Claims**

1. A low-viscosity printing fluid for printing cellulose webs which comprises an aqueous solution of a water-soluble, cationic thermosetting resin and a water-soluble dye compatible with said resin, said dye and resin mixture having a stability of from about 1 hour to in excess of 4 months, a transference value of from about 0 to about 4, and viscosity of less than 20 cps. at 77°F.

3,864,297

EMULSION POLYMERIZATION OF VINYL BROMIDE

Edwin D. Hornbaker, and Bryan Sparks, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 147,620, May 27, 1971, abandoned. This application Oct. 20, 1972, Ser. No. 299,250

Int. Cl. C08f *45/24, 3/22*

U.S. Cl. 260—29.6 R **20 Claims**

1. A process for the production of poly(vinyl bromide) latex comprising adding an aqueous solution of a reducing agent to an emulsion of vinyl bromide containing a water soluble peroxidic compound, wherein said emulsion is at a temperature of from about 0°C to about 75°C, and said aqueous solution of said reducing agent is added to said emulsion at a rate of:

a. at least about 2.8×10^{-4} equivalent of said reducing agent per hour per hundred parts by weight of vinyl bromide monomer, said emulsion containing about 1.5×10^{-3} equivalent of a peroxidic compound per hundred parts by weight of said vinyl monomer, but

b. not more than about 8.7×10^{-4} equivalent of said reducing agent per hour per hundred parts by weight of said vinyl bromide monomer, said emulsion containing about 4.6×10^{-3} equivalent of a peroxidic compound per hundred parts by weight of monomer.

3,864,298

FLUOROELASTOMER COMPOSITION

Yutaka Kometani; Shun Koizumi, both of Osaka; Takeshi Suzuki, Kyoto; Yasuyoshi Furukawa; Masayasu Tomoda, and Kiyoichi Kondo, all of Osaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

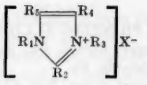
Filed Nov. 6, 1972, Ser. No. 303,764

Claims priority, application Japan, Nov. 11, 1971, 46-90488; July 25, 1972, 47-74848

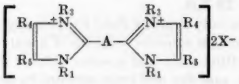
Int. Cl. C08f *45/24*

U.S. Cl. 260—29.6 F **15 Claims**

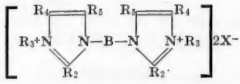
1. A fluoroelastomer composition consisting essentially of (a) a fluoroelastomer, (b) 2 to 30 parts of at least one member selected from the group consisting of a bivalent metal oxide, a bivalent metal hydroxide and a mixture of bivalent metal oxide or metal hydroxide with a metal salt of weak acid, (c) 0.5 to 5 parts of an aromatic polyhydroxy compound, (d) 0.2 to 10 parts of a quaternary ammonium compound having the general formula:



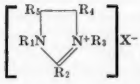
(1)



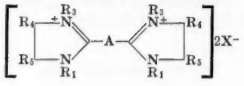
(2)



(3)

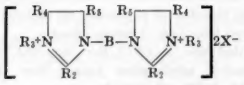


(4)



(5)

or



(6)

wherein R_1 is alkyl group having 1 to 20 carbon atoms, carbocyclic group, heterocyclic group having 1 to 3 nitrogen atoms or aralkyl group having 7 to 20 carbon atoms, R_2 is hydrogen, alkyl group having 1 to 12 carbon atoms, carbocyclic group, heterocyclic group having 1 to 3 nitrogen atoms, phenyl group, aralkyl group having 7 to 12 carbon atoms, alkoxyl group having 1 to 12 carbon atoms, benzyloxy group, hydroxyl group, carboxyl group, alkoxycarbonyl group, acyl group, benzoyl group or cyclohexylcarbonyl group, R_3 is alkyl group having 1 to 20 carbon atoms or aralkyl group having 7 to 20 carbon atoms, R_4 and R_5 are hydrogen or lower alkyl group, A is alkylene group or phenylene group, B is alkylene group, and X^- is an anion selected from the group consisting of a halide ion, hydroxylate ion, alkoxylate ion, phenoxide ion, carboxylate ion, sulfonate ion, sulfate ion, sulfite ion and carbonate ion, and (e) 0.1 to 10 parts of water or 0.5 to 30 parts of a metal compound which produces water by reacting with hydrogen fluoride, said parts of (b), (c), (d) and (e) being parts by weight per 100 parts of (a).

3,864,299

HIGHLY REACTIVE SELF-CROSSLINKABLE COPOLYMERS AND A PROCESS FOR THEIR PRODUCTION

Gunter Kolb, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 25, 1973, Ser. No. 409,407

Claims priority, application Germany, Oct. 28, 1972, 2253067

Int. Cl. C08f *15/16, 15/36, 15/38*

U.S. Cl. 260—29.7 H **4 Claims**

1. In process for producing highly reactive, self-crosslinkable copolymers of acrylamidomethylene carbamic acid esters or methacrylamidomethylene carbamic acid esters as monomer producing crosslinking sites and at least one other copolymerizable monomer by emulsion polymerization at temperatures of below about 60°C. in the presence of a radical forming catalyst, the improvement wherein acrylamidomethylene carbamic acid allyl ester, methacrylamidomethylene carbamic acid allyl ester, acrylamidomethylene carbamic acid methallyl ester or methacrylamidomethylene carbamic acid methallyl ester is used as the monomer to produce crosslinking sites.

3,864,300

WATER REDUCIBLE COATING COMPOSITIONS AND METHOD FOR PRODUCING THE SAME

Luther Clifton Robey, 2755 Brandon Ave., S.W., Roanoke, Va. 24015

Continuation-in-part of Ser. No. 288,302, Sept. 12, 1972, abandoned. This application May 24, 1973, Ser. No. 363,335

Int. Cl. C08g *51/24*

U.S. Cl. 260—29.4 UA **10 Claims**

1. A water-soluble or dispersible coating composition base consisting essentially of a mixture of (1) a water-soluble or dispersible organic amine neutralized synthetic film-forming resin and (2) an aldehyde selected from the group consisting of 3,4-dihydroxybenzaldehyde and 4-hydroxy-3-methoxybenzaldehyde, said synthetic film-forming resin comprising a combination of (i) a member selected from the group consisting of an oil modified alkyd resin, an acrylic resin and a polyester resin and (ii) an aminoplast resin, the parts by weight ratio of aminoplast resin to said member being about 1–50:99–50, said aldehyde being present in amounts effective to essentially eliminate obnoxious odors and toxic effects of vapors emitted by said composition when heated.

3,864,301
HOT ADHESIVES

Manfred H. Dollhausen, Odenthal, and Gerhard Hohmann, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

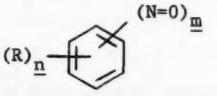
Filed Oct. 23, 1973, Ser. No. 408,849

Claims priority, application Germany, Oct. 26, 1972, 2252457

Int. Cl. C08f *45/36*

U.S. Cl. 260—31.2 R **8 Claims**

1. An adhesive composition comprising (a) 5 to 50 parts by weight of a copolymer of ethylene and a vinyl ester of an organic acid having 2 to 10 carbon atoms; (b) 5 to 50 parts by weight of a chlorination product of at least one member of the group consisting of polyethylene, polypropylene, natural rubber and polyisoprene, said chlorination product having a chlorine content of 60 to 70% by weight; (c) 5 to 50 parts by weight of a chlorinated polyphenyl resin which is solid at room temperature and is obtained by chlorinating a mixture consisting essentially of isomers of diphenylbenzene and quaterphenyls up to a chlorine content of from 20 to 70% by weight; (d) 1 to 40% by weight, based on the total weight of components (a), (b) and (c), of an aromatic polynitroso compound of the formula



wherein R is hydrogen, alkyl, alkoxy, alkanolamine, cycloalkyl, phenylalkyl, phenyl, phenylalkoxy, phenylamine, phenylnitrosoamine or halogen, *n* is an integer from 0 to 5 and *m* is 1 or 2 and (e) 30 to 90% by weight, based on the weight of the adhesive composition, of at least one solvent selected from the group consisting of aromatic hydrocarbons, chlorinated hydrocarbon ketones, esters and alcohols.

3,864,302
FLAME RESISTANT POLYAMIDES

Patrick Joseph Foley, Jr., Roselle, Ill., assignor to E. I. du Pont de Nemours and Co., Wilmington, Del.

Continuation-in-part of Ser. No. 341,872, March 16, 1973, abandoned. This application Jan. 23, 1974, Ser. No. 435,406

Int. Cl. C08g *51/56*

U.S. Cl. 260—37 N **11 Claims**

1. A polyamide composition containing a synthetic polyamide having recurring carbonamide linkages as an integral part of the chain and about 1 to 10 percent by weight of at least one ferrite selected from the class consisting of zinc ferrite and magnesium ferrite and about 1 to 20 percent by weight of at least one organic halide flame retardant which is thermally stable at the fabrication temperature of the polyamide but which is reactive at the temperature of flaming of the polyamide.

3,864,303
METHOD OF MANUFACTURING FRICTION MEMBERS OF THE THERMOSETTING RESIN TYPE

Kazuyoshi Saiki, Tokyo; Kaneyoshi Nomaguchi, Kamakura; Keiro Yoshizue, Tachibana, and Tsutomu Nagoya, Ashiarashimo, all of Japan, assignors to Sankyo Chemical Industries Ltd. and Tokyo Buhin Kogyo Company Ltd., both of Tokyo, Japan

Continuation of Ser. No. 172,564, Aug. 17, 1971, abandoned. This application Aug. 24, 1973, Ser. No. 391,325

Claims priority, application Japan, Aug. 31, 1971, 46-76061

Int. Cl. C08g *51/10*

U.S. Cl. 260—38 **7 Claims**

1. A heat-hardenable composition comprising

a. a thermosetting phenolic resin,

b. an acrylamide, and

c. fibres,

wherein said acrylamide (b) comprises from about 10 to about 100% by weight of said resin (a), wherein (b) is selected from the group consisting of acrylamide, methacrylamide, N-methyl acrylamide, N-methylmethacrylamide, N-methylolacrylamide, diacetone acrylamide, hydroxymethyl diacetone acrylamide, methylene-bisacrylamide, nitrilo-tris-acrylamide, nitrilo-tris-methacrylamide, homopolymers thereof, and copolymers thereof with acrylic acid, an acrylic acid salt, an acrylic acid ester and acrylonitrile, and wherein said fibres are selected from the group consisting of asbestos fibres, metal fibres, glass fibres and carbon fibres.

2. The composition of claim **1**, wherein said acrylamide (b) comprises from about 10 to about 40% by weight of said resin (b).

3,864,304
FRICTION PARTICLE FOR BRAKE LINING

Frank S. Grazen; Melvin L. Buike, and Frank M. Bryzinsky, all of North Tonawanda, N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Division of Ser. No. 188,598, Oct. 12, 1971, Pat. No. 3,781,241, which is a division of Ser. No. 872,753, Oct. 30, 1969, Pat. No. 3,658,751. This application Dec. 27, 1972, Ser. No. 318,950

Int. Cl. C08g *37/18, 51/10*

U.S. Cl. 260—38 **7 Claims**

1. A friction particle comprising a non-catalyzed product of the reaction at about 225° to about 400° F. of a non-hydroxyalkylated, hydroxy aromatic hydrocarbon-aldehyde resole containing substantially no etherified aromatic hydroxyl groups with an alkylated hydroxy aromatic hydrocarbon-aldehyde resole, until the resulting product is substantially insoluble in acetone, infusible, and does not soften slightly under mechanical force at a temperature below 400° F. and has substantially no cohesive or bonding strength, wherein said non-hydroxyalkylated resole comprises about 60 to about 95% of the weight of the resin components, wherein the alkylated groups are substituted on the aromatic ring and are selected from the group consisting of:

a. alkyl groups of 1 to 60 carbon atoms,

b. cycloalkyl groups of 5 to 12 carbon atoms,

c. alkyl, aryl and cycloalkyl ketonic groups wherein the hydrocarbon portion is as defined in (a) and (b),

d. alkyl, aryl and cycloalkyl carboxylic groups wherein the hydrocarbon portion is as defined in (a) and (b),

e. aryl groups of 6 to 24 carbon atoms, and

f. aryl substituted alkyl wherein the aryl is phenyl, lower alkyl-substituted phenyl or hydroxy substituted phenyl.

3,864,305
CARBON BLACK REINFORCED COMPOSITIONS

Merrill E. Jordan, Walpole; William G. Burbine, Whitman, and Frank R. Williams, Quincy, all of Mass., assignors to Cabot Corporation, Boston, Mass.

Filed Apr. 2, 1973, Ser. No. 346,979

The portion of the term of this patent subsequent to Mar. 26, 1991 has been disclaimed.

Int. Cl. C08c *11/18*

U.S. Cl. 260—42.47 **10 Claims**

1. A composition of matter comprising a rubber selected from the group consisting of natural and synthetic rubbers and a carbon black product selected from the group consisting of furnacetype carbon black products characterized by having a value for the tint factor relationship of [tint + 0.6 (D_a)], wherein D_a is apparent diameter, of at least 311 to 316, a value for the tint contribution ratio of tint to tint factor of at least 0.75 to 0.82, a pH value of at least 4, an iodine surface area of at least 67 to about 145 m^2/g and a value for the BET total surface area of less than 160 m^2/g, wherein the carbon black product is present in amounts of from about 10 to about 250 parts by weight per 100 parts by weight of rubber.

3,864,306

ESTERS OF BROMINATED DIPENTAERYTHRITOL AND POLYMERIC COMPOSITIONS CONTAINING SAME

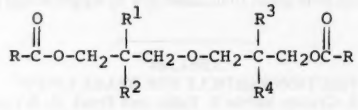
Steffen F. Dieckmann, Sharpley-Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 47,897, June 19, 1970, abandoned. This application Oct. 24, 1972, Ser. No. 300,036

Int. Cl. C08f *45/56*

U.S. Cl. 260—45.75 B **6 Claims**

1. A flame retardant composition comprising a blend of a readily flammable polyolefin, polyester, polyamide or polyurethane and as a flame retardant, based on the weight of the composition from about 3 to about 15 percent of a bromine compound having the formula



where R is an alkyl, bromoalkyl or chloroalkyl group containing 1 to 6 carbon atoms, phenyl or a phenyl group substituted with bromine, chlorine, hydroxy, lower alkyl or lower alkoxy substituents, R^1 is a bromine substituted methyl group and R^2, R^3 and R^4 are R^1 or $-CH_2OH$ and from 0 to about 5 percent of an antimony compound, said bromine compound being present in an amount sufficient to provide to the composition at least 1.9 percent of bromine when it is the sole flame retardant and at least 1.0 percent of bromine when present in combination with the antimony compound.

3,864,307

NATURAL AND SYNTHETIC DIENE POLYMERS STABILIZED WITH CRESOL DERIVATIVE ANTIOXIDANTS

Roland Nast, Dormagen-Hackenbroich; Wolfgang Redetzky, Opladen-Quettingen; Gustav Sinn, Bergisch Neukirche; Theo Kempermann; Joseph Witte, both of Cologne, and Gunter Marwede, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

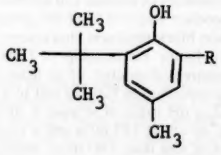
Division of Ser. No. 100,362, Dec. 21, 1970, abandoned. This application July 10, 1973, Ser. No. 378,015

Claims priority, application Germany, Jan. 3, 1970, 2000180

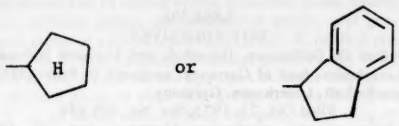
Int. Cl. C08c *7/10;* **C08d** *11/04*

U.S. Cl. 260—45.95 H **6 Claims**

1. A method for protecting natural and synthetic diene polymers against degradation through oxidation which comprises incorporating 0.01 to 5 parts by weight of a compound of the formula



wherein R is



3,864,308

NOVEL PHOTOSENSITIVE POLYMER

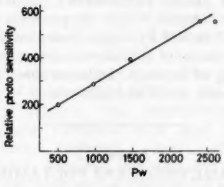
Masao Kato, Yokohama; Masaki Hasegawa, Tokyo, and Taro Ichijyo, Kamakura, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

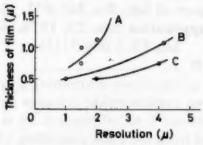
Continuation-in-part of Ser. No. 46,836, June 16, 1970, abandoned. This application June 8, 1972, Ser. No. 261,015

Claims priority, application Japan, June 17, 1969, 44-47753; June 17, 1969, 44-47754; Dec. 19, 1969, 44-192745; Dec. 19, 1969, 44-192746; Dec. 25, 1969, 44-1455; Dec. 25, 1969, 44-1456; Apr. 14, 1970, 45-31827

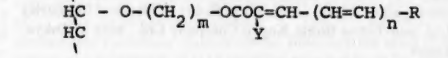
Int. Cl. C08f *3/34, 7/00, 15/02*

U.S. Cl. 260—47 UA **4 Claims**





1. A photosensitive homopolymer having a polymerized vinyl chain with repetitive units of the formula



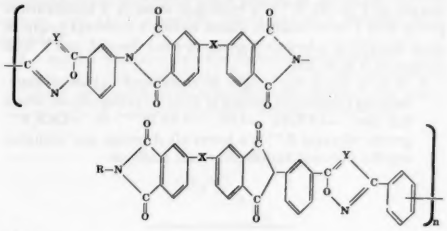
wherein Y is a hydrogen atom or a cyano group, R is a phenyl or a substituted phenyl, the substituent present in the aromatic ring of said substituted phenyl being one member selected from the group consisting of halogens, nitro, lower alkyl, methoxy, acetyl, benzoyl and cyano groups, *m* is an integer having the value of 2–4 inclusive and *n* is 0 or 1.

3,864,309
COPOLYMER OF POLYIMIDE OLIGOMERS AND TEREPHTHALONITRILE N,N-DIOXIDE AND THEIR METHODS OF PREPARATION

Norman Bilow, Los Angeles; Abraham L. Landis, Northridge, and Leroy J. Miller, Canoga Park, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 16, 1973, Ser. No. 416,483
Int. Cl. C08g *20/32*
U.S. Cl. 260—47 UA **10 Claims**

1. Copolymers of addition cured polyimides formed from the reaction of aromatic bis(nitrileoxides) and cyano- or acetylene-substituted polyimide oligomers and consisting essentially of the following general formula:



where

X = CO, O, CH_2, SO_2, or $-CF_2-$, and

Y = CH or N, and

R = $-C_6H_4OC_6H_4-$, $-C_6H_4OC_6H_4OC_6H_4-$, or $-C_6H_4OC_6H_4OC_6H_4OC_6H_4-$

and where

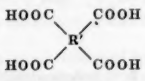
may be replaced by

3,864,310
HIGH PERFORMANCE HETEROCYCLIC POLYMER POLYMERIZATION VIA MOLTEN LEWIS ACID EUTECTICS

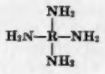
Lowell Saferstein, Piscataway, N.J., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 221,780, Jan. 28, 1972, abandoned. This application Nov. 14, 1973, Ser. No. 415,706
Int. Cl. C08g *20/20*
U.S. Cl. 260—47 CP **10 Claims**

1. In a process for synthesizing poly (benzimidazobenzphenanthrolines) from a tetracarboxylic acid reactant represented by the formula



wherein R′ is a tetravalent aromatic or cyclo-aliphatic radical, wherein each of the four carbonyl groups is attached directly to a carbon atom present in a ring of said aromatic or cycloaliphatic radical in a position which is ortho- or peri- to another carbon atom to which another of said carboxyl groups is also directly attached, or the corresponding anhydride and a tetra-amine reactant represented by the general formula



wherein R is an aromatic or cycloaliphatic tetravalent radical and wherein each of the four amino groups is attached directly to a carbon ring present in a ring of said aromatic or cycloaliphatic radical in a position which is ortho- or para- to another carbon atom, to which another set of amino groups is also directly attached, by heat reacting said reactants at a temperature below their decomposition temperature, the improvement which comprises:

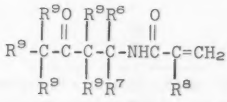
utilizing as a catalyst a heavy metal halide in admixture with a salt component which is non-reactive with said heavy metal halide and which forms a eutectic mixture therewith wherein said eutectic mixture has a melting point below the reaction temperature of said reactants and a melting point lower than that of the pure heavy metal halide.

3,864,311
COMPOSITIONS PREPARED BY THE REACTION OF AMINES WITH HYDROXYALKYLATED AND ALKOXYALKYLATED DERIVATIVES OF N-3-OXOHYDROCARBON-SUBSTITUTED ACRYLAMIDES

Richard William Jahnke, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed June 5, 1972, Ser. No. 259,889
Int. Cl. C07c *103/30*
U.S. Cl. 260—561 N **27 Claims**

1. A method for the preparation of a composition of matter which comprises reacting (A) a primary or secondary amine with (B) a water-soluble composition prepared by reacting, in the presence of an alkaline reagent, an aliphatic aldehyde containing not more than about 4 carbon atoms, or a reversible polymer thereof, with a substituted acrylamide of the formula



wherein each R^9 is individually hydrogen or a hydrocarbon radical, at least one such R^9 being hydrogen; each of R^6 and R^7 is hydrogen or a hydrocarbon radical; and R^8 is hydrogen or a lower alkyl radical; the reaction between said aldehyde and substituted acrylamide being effected in a diluent comprising (1) water, or (2) an organic liquid which is a solvent for the reactants or the product or both, or (3) a mixture of diluents 1 and 2.

3,864,312
PROCESS FOR PRODUCING A CATIONIC CARBAMOYL POLYMER PREPARED BY AMINOALKYLATION OF CARBAMOYL POLYMER IN MIXTURE OF WATER AND WATER-MISCIBLE ORGANIC SOLVENT

Mamoru Suzuki; Eiichi Hirata, and Sigenori Taziri, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 10, 1973, Ser. No. 358,998
Claims priority, application Japan, May 11, 1972, 47-47016
Int. Cl. C08g *9/04, 9/24*
U.S. Cl. 260—67.5 **12 Claims**

1. A process for producing a water-soluble powdered cationic carbamoyl polymer, which comprises reacting a carbamoyl polymer with a formaldehyde and an amine or with an

amine-formaldehyde adduct in a mixture of water and at least one organic solvent which is miscible with water and not capable of dissolving said carbamoyl polymer, the water content in said mixture of water and organic solvent being 20 to 70 percent by weight.

3,864,313
LATENT CURING AGENT FOR ISOCYANATE TERMINATED PREPOLYMERS

Samuel Eugene Susman, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed July 10, 1974, Ser. No. 487,418
Int. Cl. C08g *22/36*
U.S. Cl. 260—75 NC **7 Claims**

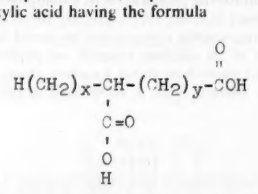
1. A heat-curable, storage-stable composition of matter comprising an isocyanate-terminated polyester or polyether based polyol urethane prepolymer of at least difunctionality in admixture with a curing amount of 1,1-dimethyl-3-cyanoguanidine.

3,864,314
FLEXIBLE POLYESTER RESINS

Robert F. Modler, and Stuart A. Harrison, both of Minneapolis, Minn., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed May 21, 1973, Ser. No. 362,642
Int. Cl. C08g *17/06;* **C09j** *3/16*
U.S. Cl. 260—75 R **1 Claim**

1. A polyester having an inherent viscosity of about 0.4 to 1.0 measured in orthochlorophenol solvent, at a concentration of 0.5 percent by weight and at a temperature of 30°C. consisting essentially of the condensation product of 1,4-butanediol, terephthalic acid, isophthalic acid and heptadecane dicarboxylic acid having the formula



where x is from 1 to 15, y from 1 to 15 and the sum of x and y is 16, wherein the 1,4-butanediol component and the total acid component are in an equivalent ratio of about 1:1 and the equivalent percent of the acids based upon the total acid equivalent are about 73 to 85 equivalent percent terephthalic acid, about 10 to 22 equivalent percent isophthalic acid and about 5 to 10 equivalent percent heptadecane dicarboxylic acid.

3,864,315
FIBER-FORMING POLYESTER COMPOSITION INCLUDING A POLYALKYLENE ETHER

Koji Ohno; Takaakira Tsuji, and Nobusuke Takeuchi, all of Kurashiki City, Japan, assignors to Kuraray Co. Ltd., Okayama Prefecture, Japan

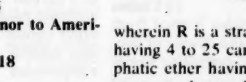
Filed Mar. 23, 1971, Ser. No. 127,340
Claims priority, application Japan, Mar. 23, 1970, 45-24719; Mar. 23, 1970, 45-24720
Int. Cl. C08g *17/14, 17/18*
U.S. Cl. 260—75 R **7 Claims**

1. A fiber-forming polyester having improved dyeability and resistance to pilling consisting essentially of the reaction product of

an ester prepared from at least one acid component consisting essentially of an aromatic dicarboxylic acid or lower alkyl ester thereof and at least one alkylene glycol having 2 to 10 carbon atoms;

wherein before the completion of the polymerization reaction is added

a. not more than Y/Y − 2 mole percent and not less than Y/15 (Y − 2) mole percent, based on the total acid component, of a polyalkylene oxide compound expressed by the general formula



wherein R is a straight chain or cyclic aliphatic hydrocarbon having 4 to 25 carbon atoms or a Y-valent residue of an aliphatic ether having 4 to 25 carbon atoms, R′ is a hydrogen atom or a lower alkyl group, n is an integer of 1 to 3, x is an integer of 1 to 50, R″ is a hydrogen atom or a hydrocarbon group with 1 to 10 carbon atoms having a carboxyl group or ester thereof, or a hydroxyl group or ester thereof, and Y is an integer of 3 to 6; and

b. ϕ to Y times the weight of compound (a) of an ester-forming compound having at least 7 carbon atoms, which has one —COOH, —OH, —COOR‴, or —OOCR‴ group, wherein R‴ is a lower alkyl group; and completing the polymerization after said addition.

3,864,316
SOLID EPOXY RESINS FROM HYDROGENATED BISPHENOLS AND AROMATIC DICARBOXYLIC ACIDS

Glenn Clarke Robinson, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 366,389, June 4, 1973,. This application Feb. 7, 1974, Ser. No. 440,413
Int. Cl. C08g *30/00, 30/10*
U.S. Cl. 260—78.4 EP **26 Claims**

1. A solid epoxy resin having a Durran's softening point of at least 80°C which can be comminuted into a stable, free-flowing powder prepared by reacting

A. an epoxy resin selected from

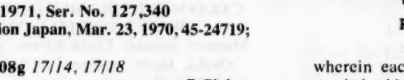
1. a diglycidyl ether of a hydrogenated bisphenol and
2. a polyglycidyl ether of a hydrogenated novolac having a functionality of from about 2.01 to about 2.6, or
3. mixtures thereof; with

B. a mixture consisting of

1. from about 10 to about 25 percent by weight, based upon the total weight of components (A) and (B), of an aromatic dicarboxylic acid or cycloaliphatic dicarboxylic acid and
2. from about 1 to about 10 percent by weight, based upon the total weight of components (A) and (B), of

a. an aliphatic dicarboxylic acid having from 4 to about 10 carbon atoms,

b. an acid terminated adduct of an aromatic or cycloaliphatic dicarboxylic acid or anhydride with an aliphatic dihydroxyl containing compound represented by the general formulas



wherein each R is independently hydrogen, methyl, ethyl, chloromethyl, bromomethyl or iodomethyl, x has a value of from 1 to about 3 and y has a value of from 3 to about 10, or

c. mixtures thereof;

wherein the quantities of components (A) and (B) are such as to provide the resultant solid epoxy resin with a percent epoxide of from about 2 to about 6 and a softening point of at least 80°C.

3,864,317

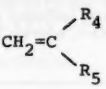
DURABLE ANTISTATIC AGENT, HYDROPHOBIC FIBERS AND FIBROUS STRUCTURES HAVING DURABLE ANTISTATIC PROPERTY AND METHOD OF MAKING SAME

Yuzuro Ogata, Wakayama, and Yukihisa Niimi, Osaka, both of Japan, assignors to Kao Soap Co., Ltd. and Kanebo, Ltd., both of Tokyo, Japan

Filed Aug. 30, 1972, Ser. No. 284,863
Claims priority, application Japan, Sept. 1, 1971, 46-67297
Int. Cl. C08f *3/92, 15/36, 3/62*
U.S. Cl. 260—79.3 M **10 Claims**

1. An antistatic agent soluble in organic solvents, for imparting a durable antistatic property to hydrophobic fibers and structures made therefrom when applied in an organic solvent system, said agent consisting essentially of a complex compound of

A. poly(2-methacryloyloxyethyltrialkylammonium) cationic polymer, containing from zero to one moles, per mole of 2-methacryoyloxyethyltrialkylammonium units, of units of a second monomer having the formula



wherein R_4 is H or methyl, and R_5 is alkoxycarbonyl, alkoxy, $-CONH_2$, $-COOH$, $-CN$ or $-C_6H_5$,

the anions of said polymer having been replaced by,

B. counter anion of at least one surfactant selected from from the group consisting of anionic surfactants containing 2 to 8 ethylene oxide units, ester-bonded sulfonates, alkylamidocarboxylic acid salts and amphoteric surfactants of the carboxylic acid type.

3,864,318

ACRYLIC AND METHACRYLIC MONOMERS, POLYMERS AND COPOLYMERS

Gerardo Caporiccio, Milan, and Ezio Strepparola, Treviglio, both of Italy, assignors to Monteratini Edison S.p.A, Milan, Italy

Division of Ser. No. 108,573, Jan. 21, 1971, Pat. No. 3,766,251. This application June 25, 1973, Ser. No. 373,268
Claims priority, application Italy, Jan. 24, 1970, 19750/70
Int. Cl. C08f *3/90, 15/02*
U.S. Cl. 260—80.3 N **9 Claims**

1. A polymer having a molecular weight of at least about 10,000 as determined by measurement of the intrinsic viscosity of a solution thereof, and which is selected from the group consisting of homopolymers of a monomer having the formula:

$$A-O-(C_3F_6O)_m(CF_2O)_n-CF_2-Z-CO-CR=CH_2$$

and copolymers of a mixture of at least two of said monomers wherein:

C_3F_6 represents a group obtained by the opening of the double bond of a hexafluoropropene molecule,

$-C_3F_6O-$ and $-CF_2O-$ are repeating oxyperfluoroalkylene units which, when simultaneously present, are distributed randomly along the chain,

m is zero or an integer from 1 to 20, n is an integer from 1 to 20, the sum of $m+n$ is an integer from 1 to 20,

A is a CF_3- or $CF_3-O-CF(CF_3)-$ terminal group,

Z is $-CH_2NR'-$ wherein R and R′ are the same or different and are hydrogen or CH_3.

3,864,319

METHOD FOR PREPARING ALTERNATING COPOLYMERS USING A FRIEDEL-CRAFTS CATALYST AND A FREE RADICAL INITIATOR IN AN AQUEOUS MEDIUM

Norman G. Gaylord, New Providence, N.J., assignor to Gaylord Research Institute, Inc., Newark, N.J.

Continuation-in-part of Ser. No. 66,887, Aug. 25, 1970, abandoned. This application Nov. 1, 1972, Ser. No. 302,964
Int. Cl. C08d *1/09, 1/18, 1/22*
U.S. Cl. 260—82.3 **9 Claims**

1. In a process for preparing equimolar alternating copolymers by copolymerization of a hydrocarbon electron donating monomer consisting of conjugated dienes with an electron accepting monomer selected from the group consisting of alkyl and aryl acrylates and methacrylates, acrylonitrile and methacrylonitrile, the improvement which comprises carrying out said copolymerization at a temperature within the range of about 0° to 100°C., in an aqueous medium containing 0.01 to 5 moles per mole of electron accepting monomer of a Friedel-Crafts halide which is at least divalent and stable to hydrolysis at the reaction temperature and 0.001 to 10 percent by weight based on the weight of the monomers of a water-soluble peroxygen compound free radical initiator.

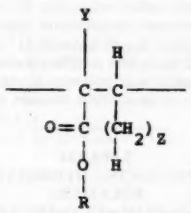
3,864,320

MODIFICATION OF ACRYLATE POLYMERS BY TREATMENT WITH METAL CARBONYL

John H. Rolker, Altadena, and Thomas C. Glasner, Los Angeles, both of Calif., assignors to Bell and Howell Co., Chicago, Ill.

Filed Jan. 22, 1973, Ser. No. 325,492
Int. Cl. C08f *27/00*
U.S. Cl. 260—86.1 E **9 Claims**

1. A method of modifying polymers which method comprises contacting a selected normally non-reactive thermoplastic polymer with a selected catalyst in a contacting zone, said polymer being a homopolymer or copolymer consisting essentially of the structural formula:



wherein R is an alkyl, cycloaliphatic alkyl or aryl radical containing from 1 to about 20 carbon atoms, Y is CH_3 or H, and Z is an integer from 0 to 12, said catalyst comprising a metal carbonyl of a group VIII transition element, said contacting being affected for a time sufficient to change the characteristics of said polymer, and recovering the resulting modified polymer from said contacting zone as a new product.

3,864,321

STYRENE CHLOROPRENE COPOLYMERS

Toshio Sakomura; Hideshige Hayashi; Takayuki Kino; Takeshi Hironaka, and Fumishige Nakane, all of 4560 Oaza Tonda, Shin-Nany Shi, Japan

Continuation-in-part of Ser. No. 205,379, Dec. 6, 1971, abandoned. This application Aug. 21, 1973, Ser. No. 390,205
Int. Cl. C08f *1/80*
U.S. Cl. 260—87.5 R **3 Claims**

1. A process for the production of a chloroprene copolymer which comprises copolymerising in an aqueous emulsion a

monomer mixture of 95 to 80 percent by weight of chloroprene and 5 to 20 percent by weight of styrene at a temperature in the range 45° to 60°C to a conversion in the range of 60 to 75 percent in the presence of a free radical initiator and an amount of dialkyl xanthogen disulphide wherein each alkyl group contains from 1 to 8 carbon atoms to ensure a final copolymer having a Mooney Viscosity (ML 1+4) in the range of 30 to 130.

3,864,322

PERFLUOROCARBON COPOLYMER POWDERS AND PREPARATION BY SPRAY DRYING

Michael D. Yallourakis, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 12, 1973, Ser. No. 350,646

Int. Cl. C08f *15/06, 29/16*

U.S. Cl. 260—87.5 A **10 Claims**

1. A perfluorocarbon polymer coating composition consisting essentially of spherical powder particles of about 1 to 75 microns in diameter of an agglomerate of submicron particles of the perfluorocarbon polymer wherein the perfluorocarbon polymer is a copolymer of tetrafluoroethylene and another copolymerizable fluorinated monomer and the powder contains about 0.5–15 per cent by weight of a nonionic surfactant.

3,864,323

METHOD OF MANUFACTURING POLYCOAGULANTS

Artur Stoy, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Narodni/Prague, Czechoslovakia

Filed June 29, 1971, Ser. No. 158,103

Claims priority, application Czechoslovakia, July 2, 1970, 4627-70

Int. Cl. C08f *3/76, 15/02, 27/14*

U.S. Cl. 260—88.7 R **6 Claims**

1. A method of manufacturing a polycoagulant comprising polymerizing 10 to 20 percent by weight of acrylonitrile in a nitric acid solution of about 50 to 65 percent concentration, said polymerization being carried out at a temperature between 10° and 20°C in the presence of an inorganic free radical catalyst, and thereafter subjecting the resultant polymer solution to an increased temperature for a period of time ranging between about 4 – 10 hours at 41° – 50°C and 5 – 12 days at 22° – 25°C sufficient to effect partial acid hydrolysis of said polymer until said polymer forms a polycoagulant completely soluble in an aqueous solution of a weak alkali.

3,864,324

METHOD FOR PRODUCING HYDROXYL FUNCTIONAL POLYMERS

Toshio Yukuta; Takashi Ohashi; Yoshiko Taniguchi, and Katsuhiko Arai, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Aug. 1, 1973, Ser. No. 384,536

Claims priority, application Japan, Aug. 1, 1972, 47-77180

Int. Cl. C08d *5/04*

U.S. Cl. 260—94.7 A **18 Claims**

1. A solution method for producing hydroxyl functional polymers having a number average molecular weight of about 500 to 50,000 and containing hydroxyl functional groups at both ends and/or on the side chain, which comprises ozonizing some of the double bonds of homopolymers or copolymers having a high molecular weight and containing olefinically unsaturated double bonds represented by at least one of the general formulae

$$-CH=CH- \quad \text{and} \quad CX_2=Ch-$$

wherein X is hydrogen, an alkyl or an aryl group, with a gaseous mixture of carrier gas containing ozone in an amount of 0.1 – 0.5% by weight based on carrier gas, and reducing the resulting ozonides with 0.5 to 3.0 equivalents based on equivalent of said ozonides of sodium bis(2-methoxyethoxy)aluminum hydride at a temperature of –20°C to +100°C to convert the ozonides into the hydroxyl functional polymers.

3,864,325

(N^{A1}, N^{B1}, N^{B29}, CARBAMOYL)-(O^{A14}, O^{B16}, O^{B26}ARYL) INSULIN DERIVATIVES

Derek George Smyth, Stanmore, England, assignor to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 221,061, Jan. 26, 1972, abandoned. This application Nov. 13, 1972, Ser. No. 306,369

Claims priority, application Great Britain, Nov. 18, 1971, 53622/71; Nov. 18, 1971, 53623/71

Int. Cl. C07c *103/52;* **C07g** *7/00;* **A61k** *17/02*

U.S. Cl. 260—112.7 **10 Claims**

1. An insulin in which at least one of the amino groups of the A_1 (glycine), B_1 (phenylalanine) and B_{29} (lysine) amino acid units is blocked by a carbamyl substituent or a substituted carbamyl substituent of the formula R_1R_2NCO- wherein R_1 and R_2 is hydrogen, lower alkyl, or phenyl and at least one of A_{14}, A_{19}, B_{16} and B_{26} tyrosine hydroxyl groups is substituted by acetyl, chloroacetyl, ethoxycarbonyl, glutaryl, stearyl, octadecylsuccinyl, naphthoyl, carbamyl or substituted carbamyl of the formula R_1R_2NCO-, wherein R_1 and R_2 are as above defined.

3,864,326

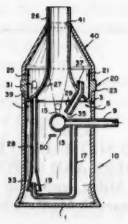
SPRAYING DEVICES, IN PARTICULAR NEBULIZING DEVICES

Robert S. Babington, 1113 Ingleside Ave., McLean, Va. 22101

Filed May 22, 1972, Ser. No. 255,681

Int. Cl. F02m *15/04*

U.S. Cl. 261—142 **26 Claims**



1. A nebulizing unit comprising in combination, a base flask having an open top; a closure member for said flask, said closure member including at least one vertical chimney having a flaring lower end; a collar surrounding the lower end of the chimney and defining first, a support for the chimney and, secondly, with the chimney end, an annular holding reservoir; a first conduit opening into said reservoir and having a lower terminal end disposed beneath the reservoir at a point closely adjacent the bottom of the base flask; at least a second conduit opening into said holding reservoir and having one end disposed in the lowermost point thereof and the opposite end disposed below the bottom of the holding reservoir and projecting into the base flask adjacent its mouth; at least one plenum chamber having a spherical end with an aperture therein disposed within the base flask and beneath the terminal end of said second mentioned conduit; and its opposite end disposed outside of the side wall of said base flask; a branch line in communication with said plenum chamber and having a terminal end disposed adjacent the bottom of said base flask and in registry with said first mentioned conduit opening into said holding reservoir and discharging therein.

3,864,327

REMOVAL OF MERCURY FROM SOLUTIONS

Wayne N. Marchant, Sparks, Nev., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Sept. 19, 1973, Ser. No. 398,908
Int. Cl. C08b 21/34
U.S. Cl. 260—231 A 5 Claims

1. An adsorbent for removal of mercury from aqueous solution consisting essentially of a cellulose matrix having grafted thereto a plurality of vicinal dithiol-substituted hydrocarbon radicals.

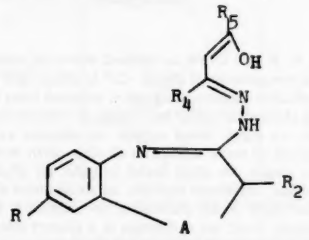
3,864,328

2-HYDRAZINO BENZODIAZEPINE DERIVATIVES

Rodney Ian Fryer, North Caldwell, and Armin Walser, West Caldwell, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

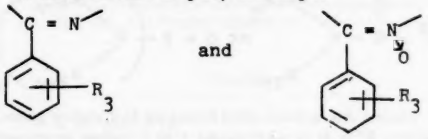
Filed Oct. 19, 1973, Ser. No. 408,245
Int. Cl. C07d 53/04, 57/02
U.S. Cl. 260—239 BD 2 Claims

1. A compound of the formula



wherein

A is selected from the group consisting of



R is selected from the group consisting of hydrogen, halogen, nitro, trifluoromethyl, lower alkyl, and lower alkoxy; R_2 signifies hydrogen or lower alkyl; R_3 signifies hydrogen or halogen; and R_4 and R_5 are individually hydrogen or lower alkyl, with at least one of R_4 and R_5 being lower alkyl.

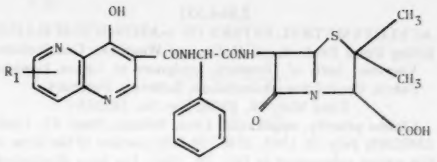
3,864,329

PENICILLINS SUBSTITUTED WITH HETEROCYCLIC GROUPS

Hisao Tobiki, Osaka; Kozo Shimago, Takarazuka; Shigeru Okano, Osaka; Toshiaki Komatsu; Toyozo Katsura, both of Takarazuka; Yasushi Taira, and Yasuko Eda, both of Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 213,745, Dec. 29, 1971, abandoned. This application Sept. 26, 1972, Ser. No. 292,325
Int. Cl. C07d 99/16
U.S. Cl. 260—239.1 12 Claims

1. A penicillin of the formula:



wherein R_1 is hydrogen, lower alkyl, lower alkoxy, lower alkylthio, amino, lower alkylamino, di(lower)alkylamino, hydroxyl, acetoacetylamino, acetylamino or benzyloxycarbonylamino.

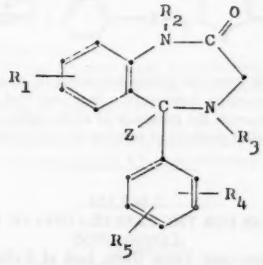
3,864,330

BENZODIAZEPINE DERIVATIVES AND PRODUCTION THEREOF

Junki Katsube, Toyonaka; Yoshinori Takashima, Minoo; Toshiyuki Hirohashi, Ashiya; Kikuo Ishizumi, Ikeda; Mitsuhiro Akatsu, Toyonaka; Kazuo Mori, Kobe; Isao Katsuki, Minoo; Yoshiharu Kume, Takarzuka; Hiromi Sato, Takarzuka; Shigeho Inaba, Takarzuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited

Filed Aug. 21, 1972, Ser. No. 282,012
Claims priority, application Japan, Aug. 31, 1971, 46-67310; Nov. 5, 1971, 46-88569; Nov. 8, 1971, 46-89237; Jan. 31, 1972, 47-11729; Apr. 26, 1972, 47-43036
Int. Cl. C07d 33/06
U.S. Cl. 260—239.3 D 9 Claims

1. A compound of the formula:



wherein R_1 is a halogen atom or nitro, R_2 is hydrogen or C_1 — C_6 alkyl; R_3 is C_1 — C_4 alkyl; R_4 and R_5 are hydrogen or ortho-halogen and Z is amono, C_1 — C_4 alkyl amino, hydroxy-C_1 — C_4 alkyl amino, an N′,N′-dilower alkylamino -C_1 — C_4 alkyl, benzylamino, hydrazino, cyano, C_1 — C_6 alkyl, C_2 — C_7 alkoxy, 3′-tetrahydropyranyloxy-1′-propynyl or 3′-(3″-azabicyclo(3,2,2,)-2″-nonyl)-1′-propynyl.

3,864,331

ACYLOXYMETHYL ESTERS OF α-AMINOPENICILLINS

Erling Knud Frederiksen, Holte, and Wagn Ole Godtfredsen, Vaerlose, both of Denmark, assignors to Loven kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark

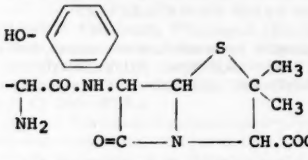
Filed Mar. 10, 1970, Ser. No. 18,355

Claims priority, application Great Britain, Mar. 13, 1969, 13402/69; July 18, 1969, 36407/69. The portion of the term of this patent subsequent to Oct. 20, 1989, has been disclaimed.

Int. Cl. C07d 99/16

U.S. Cl. 260—239.1 2 Claims

1. A compound of the formula



and pharmaceutically acceptable salts thereof.

3,864,332

METHOD OF PREPARING α-AMINOBENZLPENICILLIN

Meri Solomonovna Rabinovich, ulitsa 1812 Goda, 2, kv. 168; Leonard Sergeevich Povarov, ulitsa Krasikova 19, kv. 28, and Galina Sergeevna Pavljuk, Euranskaya ulitsa, 26, korp. 1, kv. 140, all of Moscow, U.S.S.R.

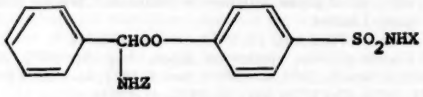
Filed May 18, 1972, Ser. No. 254,677

Claims priority, application U.S.S.R., May 18, 1971, 1651444; Apr. 24, 1972, 1772937

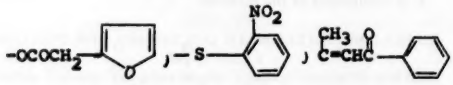
Int. Cl. C07d 99/16

U.S. Cl. 260—239.1 6 Claims

1. A method for preparing α-aminobenzylpenicillin comprising reacting an acylal derivative of 6-aminopenicillinanic acid with an activated ester of N-protected D(−)α-aminophenylacetic acid having the formula:



where Z is selected from the group consisting of:



X is selected from the group consisting of hydrogen and 2-pyrimidyl, at room temperature in a reaction-inert organic solvent medium in the presence of acetic acid, and hydrolyzing the reaction product to remove the protecting groups.

3,864,333

PROCESS FOR THE PREPARATION OF FURANE COMPOUNDS

Wilfried Sahm, and Anton Horn, both of Kelkheim/Taunus, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt/Main, Germany

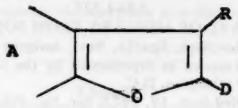
Filed Aug. 10, 1972, Ser. No. 279,645

Claims priority, application Switzerland, Aug. 13, 1971, 11926/71

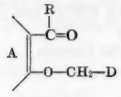
Int. Cl. C07d 5/40

U.S. Cl. 260—240 D 5 Claims

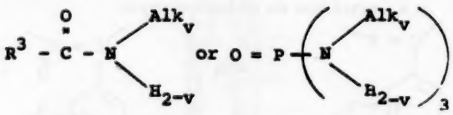
1. A process for the preparation of a compound of the formula



in which A is a benzene or naphthalene nucleus two adjacent carbon atoms of which are condensed with the furane nucleus in the manner indicated, R is hydrogen, lower alkyl or phenyl and D is phenyl, naphthyl, styryl, benzoxazolyl, naphthoxazolyl, benzofuranyl, naphthofuranyl or phenyl, biphenylyl or styryl substituted by benzofuranyl or naphthofuranyl, which substituents D and A are unsubstituted or substituted by lower alkyl, lower alkoxy, lower alkenyl, lower alkylene, carboxy, lower carboalkoxy, carboxylic acid amide, carboxylic acid mono- and di-(lower alkyl) amide, carboxylic acid piperidide or morpholide, cyano, sulfo, sulfonic acid lower alkyl ester, sulfonic acid amide or mono- or di-(lower alkyl) amide, or halogen, which process comprises splitting off water from an ether of the formula



in which A, R and D are as defined above by reacting said ether at a temperature of about −20° to about 200° C. with a strongly alkaline condensating agent selected from the group consisting of an alkali metal hydroxide, an alkaline earth metal hydroxide, an alkali metal sulfide, an alkaline earth metal sulfide, an alkali metal amide, an alkaline earth metal amide, aluminum amide, an alkali metal hydride, an alkaline earth metal hydride, aluminum hydride, an alkali metal alcoholate, an alkaline earth metal alcoholate, an aluminum alcoholate and a strongly basic ion exchanger in a solvent selected from the group consisting of those of the formulae



wherein Alk is lower alkyl having up to 4 carbon atoms, wherein R^3 is H or alkyl having 1 to 3 carbon atoms and wherein v is zero or the numbers 1 or 2, tetramethyl urea, N-methyl-2-pyrrolidone, acetonitril, pyridine and a mixture of said solvents.

3,864,334

DERIVATIVES OF CERTAIN N-OXYPRIDYL GERANYL ETHERS AND THEIR USE IN CONTROLLING INSECTS

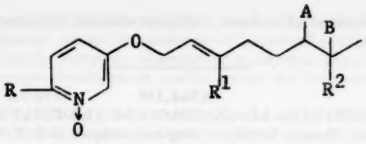
Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 2, 1973, Ser. No. 412,091

Int. Cl. C07d 31/28

U.S. Cl. 260—240 H 3 Claims

1. a compound of the formula:



in which R is hydrogen; halogen; or alkyl having one to four carbon atoms; R^1 is methyl or ethyl; R^2 is methyl or ethyl; A and B together form an oxygen bridge or a bond, or A is hydrogen and B is hydrogen, methoxy or ethoxy.

3,864,335

POLYFUNCTIONAL ESTER OXAZOLIDINES

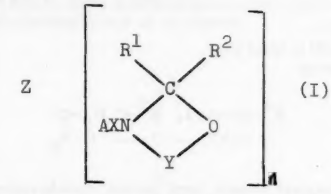
William D. Emmons, Huntingdon Valley, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 768,905, Oct. 18, 1968, abandoned. This application Feb. 11, 1972, Ser. No. 225,673

Int. Cl. C07d *85/26*

U.S. Cl. 260—240 R **14 Claims**

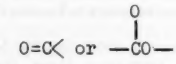
1. A compound of the formula



wherein *n* is an integer equal to the valence of Z of two or three;

Z is saturated divalent hydrocarbon alkylene having 1 to 34 carbon atoms, di- or trivalent phenylene or halo-substituted phenylene, the divalent hydrocarbon residue of 1,1,3-trimethyl-5-carboxy-3-(p-carboxyphenyl) indane, (C_2-C_3) divalent alkenyl or

A is -O- when Z is



(the free carbonyl being connected to Z) when Z is other than

X is

wherein *m* is 2 or 3;

R^1 is hydrogen, phenyl, benzyl or (C_1-C_{12})alkyl;

R^2 is hydrogen or (C_1-C_4)alkyl or R^1 and R^2 can be taken together to form pentamethylene, tetramethylene or (C_1-C_4)-alkyl-substituted pentamethylene or tetramethylene; and

Y is

wherein *m'* is 2 or 3.

3,864,336

IMINES, THEIR PREPARATION AND THEIR PHARMACEUTICAL USE

Florin Seng, Koln-Buchheim; Kurt Ley, Odenthal-Globusch, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

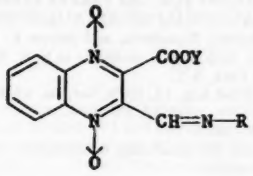
Division of Ser. No. 130,007, March 31, 1971,. This application May 11, 1973, Ser. No. 359,308

Claims priority, application Germany, Apr. 2, 1970, 2015676

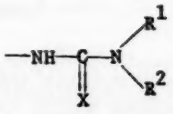
Int. Cl. C07d *51/78*

U.S. Cl. 260—240 G **12 Claims**

1. A compound of the formula



or a pharmaceutically acceptable non-toxic salt thereof wherein Y is hydrogen, an alkali metal cation or the cation R^5—N^+H_3; and each of R and R^5 is



in which

X is O, S or NH, and

each of R^1 and R^2 when taken independently is identical to or different from the other, and is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms and hydroxyalkyl of 1 to 4 carbon atoms, or R^1 and R^2 together with the nitrogen atom to which they are attached form a morpholino or S,S-dioxothiomorpholino ring.

3,864,337

8-SUBSTITUTED CARBOCYANINE DYES, SUBSTITUTED VINYL CYANINE DYE INTERMEDIATES, PROCESSES FOR PREPARATION AND NOVEL PHOTOGRAPHIC ELEMENTS

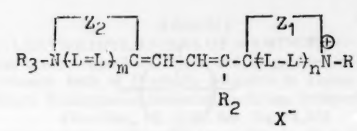
John R. Owen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 30, 1971, Ser. No. 185,453

Int. Cl. C09b *23/06*

U.S. Cl. 260—240.6 **9 Claims**

1. A carbocyanine dye having the formula:



wherein R_1 and R_3 each independently represent a lower alkyl group, a lower alkenyl group or an aryl group of 6 to 10 carbon atoms; R_2 represents a substituent selected from the group consisting of anilino, p-toluidino, lower alkyl substituted anilino, N-lower alkyl anilino, N-lower alkyl-p-toluidino, N-lower alkyl carbonyl anilino, and N-lower alkyl carbonyl p-toluidino; each L represents a methine group; *m* and *n* each represent 0 or 1; X^- represents an acid anion; and Z_1 and Z_2 each represent the non-metallic atoms necessary to complete a 5 to 6 membered heterocyclic ring selected from the group consisting of a thiazole nucleus, an oxazole nucleus, a selenazole nucleus, a thiazoline nucleus, a 2-pyridine nucleus, a 4-pyridine nucleus, an imidazole nucleus, a quinoline nucleus, a 3,3-dialkylindolenine nucleus, a (4,5-b)quinoxaline nucleus, a 3H-pyrrolo(2,3-b)-pyridine nucleus, or a thiazolo(4,5-b) quinoline nucleus.

3,864,338

PROCESS FOR THE PREPARATION OF Δ^2-CEPHALOSPORIN ALDEHYDES

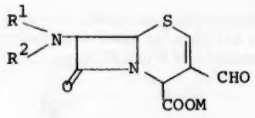
Ekkehard Bohme, Highstown, and Joseph E. Dolfini, North Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed Aug. 11, 1970, Ser. No. 63,007

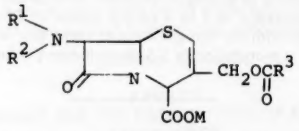
Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **5 Claims**

1. A process for producing Δ^2-cephalosporin-3-aldehydes having the formula



wherein R^1 is selected from the group consisting of lower alkanoyl, thienylacetyl, phenylacetyl, phenoxyacetyl, benzoyl, chloroacetyl, 2-amino-2-phenylacetyl, and α-aminocyclohexadienylacetyl; R^2 is hydrogen; R^1R^2N taken together are phthalimido; and M is selected from the group consisting of hydrogen, lower alkyl, trichloroethyl, and a pharmaceutically acceptable nontoxic salt thereof; which comprises treating a compound having the formula



wherein R^3 is selected from the group consisting of lower alkyl, phenyl, chlorophenyl, lower alkoxyphenyl, benzyl, and styryl; with a halogenating agent selected from the group consisting of N-bromosuccinimide, N-chlorosuccinimide, N-chlorophthalimide, N-bromoacetamide, sulfuryl chloride, t-butylhypoiodite, molecular chlorine, and molecular bromine; in the presence of a catalytic amount of a catalyst selected from the group consisting of hydrogen peroxide, benzoyl peroxide, t-butyl hydroperoxide, acetyl peroxide and azobisisobutyronitrile and a solvent selected from the group consisting of chloroform, methylene chloride, and dimethoxyethane.

3,864,339

SUBSTITUTED 1 H-OXAZOLO(4,3-C)(1,4)THIAZINIUM

Robert Thomas, Guildford, England, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

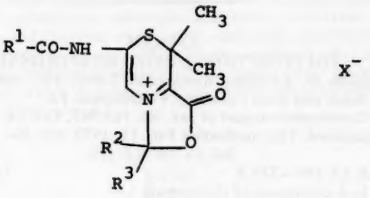
Filed Sept. 28, 1973, Ser. No. 401,797

Claims priority, application Great Britain, Jan. 3, 1973, 410/73

Int. Cl. C07d *93/10*

U.S. Cl. 260—243 R **6 Claims**

1. A compound of the formula



wherein R^1 is lower alkyl,

R^4-phenyl, R^5-C_6H_5-$\underset{R_6}{C}$-

phenoxymethyl, thienyl, furyl, pyridyl, cyclohexadienyl, cyclohexadienylmethyl, thienylmethyl, furylmethyl, pyridylmethyl;

R^2 and R^3 each is lower alkyl or phenyl;

R^4 is hydrogen, halogen or lower alkyl;

R^5 is hydrogen, halo, hydroxy, lower alkoxy or lower alkyl;

R^6 is hydrogen, amino, halo, carboxy or lower alkoxy and X is halogen.

3,864,340

PROCESS FOR PRODUCING 7-ACYLAMIDO-3-CEPHEM-4-CARBOXYLIC ACIDS

Toshiyasu Ishimaru, Osaka, and Yutaka Kodama, Toyamaken, both of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

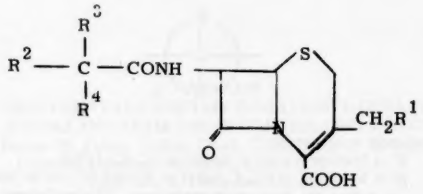
Filed Dec. 27, 1972, Ser. No. 318,714

Claims priority, application Japan, Dec. 28, 1971, 46-2201; Dec. 28, 1971, 46-2202

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **10 Claims**

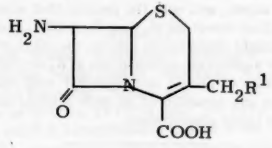
1. In a process for producing 7-acylamido-3-cephem-4-carboxylic acids represented by the formula:



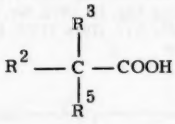
wherein R^1prepresents hydrogen, halogen, azido, acetoxy, lower alkyloxy, phenoxy or 5-lower alkyl-1,3,4-thiadiazol-2yl

thio group: R^2represents hydrogen, lower alkyl, phenyl, hydroxyphenyl, thienyl, tetrazolyl or a C_{1-7}cycloalkenyl group; R^3represents hydrogen, phenoxy or pyridylthio group and R^4represents hydrogen or amino group, the improvement which comprises:

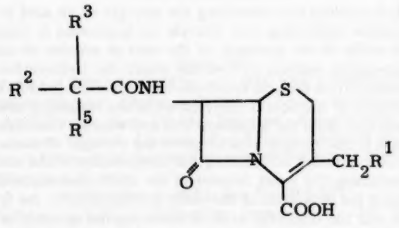
reacting an alkali salt or a tertiary amine salt selected from the group consisting of trimethylamine, triethylamine, tripropylamine, tributylamine, N-methylpiperidine, N-ethylpiperidine, N-methylmorpholine, dimethylethylamine, pyrrolidine, piperidine and diethylamine salts of 7-amino-3-cephem-4-carboxylic acid of the formula:



wherein $R^1$is the same as defined above, with a reactive derivative of a carboxylic acid of the formuls:



wherein R^5represents hydrogen or an amino group protected in the form of a salt of hydrochloric acid, hydrobromic acid or p-toluenesulfonic acid or an N protected amino group wherein said protecting group is lower alkoxycarbonyl, halo lower alkoxycarbonyl, nitrophenoxycarbonyl, benzyloxycarbonyl, benz-hydryloxycarbonyl, cyclopentyloxycarbonyl, furfuryloxycarbonyl, formyl, trifluoroacetyl, phthaloyl, succinoyl, trityl, bis(p-methoxyphenyl)-methyl, bis (p-methoxyphenyl)-phenyl methyl, o-nitrophenylsulfenyl or 2,4-dinitrophenyl-sulfenyl or an enamine compound of an aldehyde, a β-diketone, a β-keto-acid ester or a β-keto acid amide and $R^2$and $R^3$are the same as defined above, in the presence of a C_{1-3}mono-,di,or trihydric alcohol as a solvent to produce a compound of the formula:



wherein R^1, R^2, $R^3$and R^5aare as defined above, and then removing the protecting group of the amino group when R^5represents an N-protected amino group or an amino group protected in the salt form.

3,864,341

3-MORPHOLINO-2-CYANOACRYLAMIDE

Ronald M. Cresswell, Scarsdale; John W. Mentha, Hartsdale, and Russell Seaman, Chappaqua, all of N.Y., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 781,590, Dec. 5, 1968, Pat. No. 3,682,957. This application Apr. 14, 1972, Ser. No. 244,305

Claims priority, application Great Britain, Feb. 2, 1968, 5397/68

Int. Cl. C07d *87/44*

U.S. Cl. 260—247.2 A **1 Claim**

1. 3-morpholino-2-cyanoacrylamide.

3,864,342

HERBICIDAL N-SUBSTITUTED-DITHIOAMINO AND N-SUBSTITUTED- OXYTHIOAMINO TRIAZINES

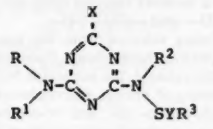
James D. Cleveland, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 251,088, May 8, 1972,. This application Jan. 2, 1974, Ser. No. 430,321

Int. Cl. C07d *55/20*

U.S. Cl. 260—249.8 **11 Claims**

1. Triazine compound of the formula



wherein X is fluorine, chlorine, bromine, alkoxy of 1 to 4 carbon atoms, or alkylthio of 1 to 4 carbon atoms, R is hydrogen or alkyl of 1 to 4 carbon atoms, R^1 is alkyl of 1 to 4 carbon atoms, R^2 is alkyl of 1 to 4 carbon atoms, R^3 is alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms or carbocyclic mononuclear or binuclear aryl of 6 to 12 carbon atoms and of up to 2 fluorine, chlorine, bromine, trifluoromethyl, nitro or alkoxy of 1 to 4 carbon atoms, and Y is oxygen or sulfur.

3,864,343

7-ALKOXYCARBONYL-4-HYDROXYMETHYL-1-PHTHALAZONE COMPOUNDS

Michiro Inoue, 26-3 6-Chome Kokurgo-Cho; Masayuki Ishikawa, 14-13 3-Chome Akazutsumi; Takashi Tsuchiya, 17-25,5-Chome Minomikoiwa, and Takio Shimamoto, 13-Kitamachi, Shinjuku-Ku, all of Tokyo, Japan

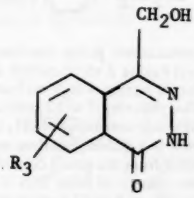
Filed July 24, 1972, Ser. No. 275,171

Claims priority, application Japan, Aug. 5, 1971, 46-58643

Int. Cl. C07d *51/06*

U.S. Cl. 260—250 P **2 Claims**

1. A compound of the following formula:



wherein R_3 is alkoxycarbonyl having C_1–C_5 alkoxy and the water-soluble pharmaceutically acceptable acid salts thereof.

3,864,344

3-(BENZOYL)-2-(4'-ANILINO CARBONYL OR BENZOXY-ALKYL PIPERAZINO)-PROPIONITRILES

Thomas Raabe, Heusenstamm Uber Offenbach, Germany; Adolf Stachel, deceased, late of Frankfurt (Main)-Fechenheim, Germany (by Ingeburg Lydia Katharina Stachel, heiress); Josef Scholtholt, Frankfurt (Main)-Fechenheim, and Rolf-Eberhard Nitz, Bergen-Enkheim, both of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt (Main)- Fechenheim, Germany

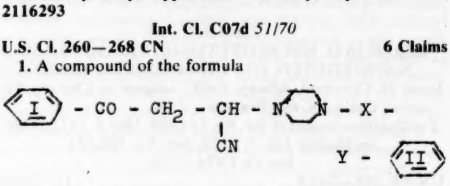
Division of Ser. No. 239,359, March 29, 1972,. This application May 11, 1973, Ser. No. 359,442

Claims priority, application Germany, Apr. 2, 1971, 2116293

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 CN **6 Claims**

1. A compound of the formula



wherein X stands for alkylene having 1 to 4 carbon atoms,

Y stands for a member selected from the group consisting of —O—CO— and —CO—NH—

the nucleus I being selected from the group consisting of phenyl, methylphenyl, chlorophenyl, fluorophenyl and mono-, di- and tri-methoxyphenyl, the nucleus II being selected from the group consisting of phenyl, chlorophenyl, mono-, di- and tri-methylphenyl, mono- di-, and tri-methoxyphenyl, or a pharmaceutically acceptable acid addition salt of said compound.

3,864,345

PROCESS FOR PREPARING NOVEL N-(PIPERAZINYLETHYL)-CARBAMATES

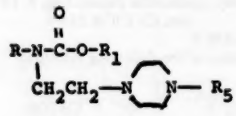
Franklin W. Abbate, and William J. Farrissey, Jr., both of North Haven, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 15,925, March 2, 1970, Pat. No. 3,719,680. This application Dec. 13, 1972, Ser. No. 314,611

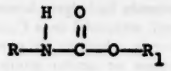
Int. Cl. C07d *51/70*

U.S. Cl. 260—268 R **10 Claims**

1. A process for preparation of a compound of the formula:



wherein R is a hydrocarbon group selected from the group consisting of alkenyl having 2 to 12 carbon atoms, and cycloalkyl and cycloalkenyl having 4 to 8 carbon atoms, and aryl and aralkyl and alkaryl having 7 to 12 total carbon atoms: R_1 is selected from the group consisting of CH_3 and straight chain lower alkyl of from 2 to 8 inclusive carbon atoms; $CH_2CH_2R_3$, wherein R_3 is selected from the group consisting of CH_3O and straight chain lower alkoxy of from 2 to 8 inclusive carbon atoms, and aryloxy of from 6 to 12 carbon atoms and with the proviso that when R_5 is $CH_2CH_2R_3$, then R_1 is the same substituent group; which comprises the step of reacting a carbamate of the formula:



wherein R and R_1 have the same meaning as previously defined, with triethylenediamine and an alkylating agent of the formula:

$$R_4COOR_5,$$

wherein R_4 is selected from the group consisting of CH_3 and straight chain lower alkyl of from 2 to 8 inclusive carbon atoms, CH_3O and straight chain lower alkoxy of from 2 to 8 inclusive carbon atoms, R_5 is selected from the group consisting of CH_3 and straight chain lower alkyl of from 2 to 8 inclusive carbon atoms; and with the proviso that when R_4 is CH_3 or straight chain lower alkyl, then R_5 is CH_3; and when R_4 is CH_3O or straight chain lower alkoxy, the alkyl group thereof has the same number of carbon atoms as R_5 aryl being selected from the group of phenyl and naphthyl; said reaction being conducted in the presence of an inert organic solvent which is a liquid at room temperature.

3,864,346

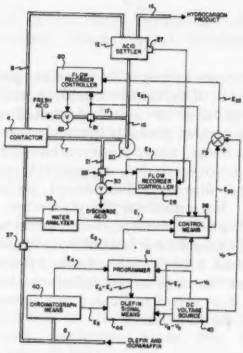
MEANS AND METHOD FOR CONTROLLING THE STRENGTH OF ACID IN AN ALKYLATION UNIT

Edward T. Child, Hacienda Heights, Calif.; John E. May, Nederland, Tex., and William D. Stephanek, Fishkill, N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 169,385, Aug. 5, 1971, Pat. No. 3,733,473. This application Aug. 21, 1972, Ser. No. 282,092

Int. Cl. C07c *3/14*; **G01n** *31/08*; **G06g** *7/58*

U.S. Cl. 260—683.59 **3 Claims**



3. A method for controlling the strength of an acid in an alkylation processing unit wherein an isoparaffin is reacted with olefin in the presence of the acid to provide an acid-hydrocarbon mixture to a settler where the hydrocarbon is separated from the acid to provide a hydrocarbon product and a portion of the acid is recycled while the remaining acid is discharged from the alkylation unit and wherein fresh acid is added to the recycle acid to affect the strength of the acid, which comprises determining the composition of the olefin, determining the water content of the olefin and isoparaffin, sensing the flow rates of the olefin and isoparaffin, the fresh acid and the discharge acid, determining the quantity of an alkylate compound being formed from the olefin and isoparaffin in the acid and immediately leaving the acid phase after formation, determining the quantity of an acid contaminate compound being formed in the acid phase from the alkylate compound and which can return to the alkylate compound, determining the quantity of another acid contaminate com-

pound being formed from the alkylate compound and which cannot return to the alkylate compound, and controlling the flow rate of one of the acids of the fresh acid and discharge acid relative to the flow rate of the other acid so as to control the acid strength in accordance with the determination of the water content of the olefin and isoparaffin, with the determination of the flow rates of the olefin and isoparaffin, the fresh acid and the discharge acid, and with the determination of the quantities of the alkylate and acid contaminate compounds.

3,864,347

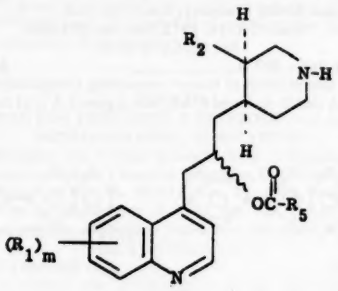
Juerg Albert Walter Gutzwiller, Bettingen, Switzerland, and Uskokovic, Milan Radoje, Montclair, N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 212,774, Dec. 27, 1971, Pat. No. 3,772,302, which is a continuation-in-part of Ser. No. 108,784, Jan. 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 837,354, June 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 741,914, July 2, 1968, abandoned. This application Aug. 1, 1973, Ser. No. 384,765

Int. Cl. C07d *43/24*

U.S. Cl. 260—287 R **5 Claims**

1. An epimeric compound of the formula



wherein *m* is 0, 1 or 2; Rphd 1 is hydrogen, hydroxy, chloro, trifluoromethyl, methyl, methoxy, ethyl, propyl, butyl, or, when *m* is 2, R_1 with an adjacent R_1, additionally is methylenedioxy; R_2 is vinyl or ethyl; and R_5 is lower alkyl of 1 to 7 carbon atoms, phenyl or benzyl;

3,864,348

1-OXA-3,8-DIAZA SPIRO (4,5) DECANE COMPOUNDS

Gilbert Regnier, Chatenay Malabry; Roger Canevari, Villebon/Yvette; Jean-Claude Poignant, Bures/Yvette, and Jacques Duhault, Chatou, all of France, assignors to "Science Union et Cie, Societe Francaise de Recherche Medical", Suresnes, France

Filed Oct. 6, 1972, Ser. No. 295,731

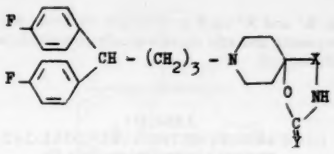
Claims priority, application France, Oct. 29, 1971, 71.38875

Int. Cl. C07d *29/36*

U.S. Cl. 260—293.66 **4 Claims**

1. A compound selected from the group consisting of:

A. 1-oxa-3,8-diaza spiro (4,5) decane compounds of the formula:



wherein:

X is selected from the group consisting of methylene and carbonyl, and

Y is selected from the group consisting of oxygen and sulfur; and

B. physiologically tolerable addition salts thereof.

3,864,349

HYDRAZONIUM SALTS

Minoru Nagao, Ibaraki; Takashi Iwata, Kyoto; Hideo Yagi, Osaka; Saburo Tamura, Tokyo; Hisae Haruta, Ibaraki, and Kazuo Nakanishi, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

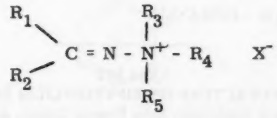
Filed June 2, 1971, Ser. No. 149,352

Claims priority, application Japan, June 11, 1970, 45-50920; July 25, 1970, 45-65235

Int. Cl. C07d *29/12*

U.S. Cl. 260—293.65 **25 Claims**

1. A hydrazonium salt of the formula



wherein R_1 is a hydrogen atom or a lower alkyl radical; R_2 is a 5 to 7-membered cycloalkenyl radical of from 5 to 10 carbon atoms, a 5 to 10-membered cycloalkenyl-(lower)alkenyl radical of 7 to 12 carbon atoms, or R_1 and R_2 are both lower alkyl radicals which are linked together to form a 5 to 7-membered cycloalkyl or cycloalkenyl group of not more than 10 carbon atoms; R_3 and R_4 are each a lower alkyl radical which may be linked directly together to form a 5 to 7-membered saturated heteromonocyclic group containing a nitrogen atom; R_5 is a lower alkyl radical and X is a halogen atom.

3,864,350

PRIDYL-1H-BENZIMIDAZOLE N-OXIDES

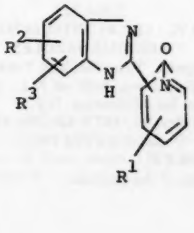
Rudiger D. Haugwitz, Titusville, and Venkatachala Lakshmi Narayanan, Hightstown, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 18, 1974, Ser. No. 452,245

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 C **5 Claims**

1. A compound of the formula



wherein R^1 and R^3 each is hydrogen or lower alkyl; R^2 is isothiocyanato; and acid physiologically acceptable acid addition salts thereof.

3,864,351

1-(α-CARBOXYMETHOXYBENZOYL-2-(2'-PYRIDYL)BENZIMIDAZOLES

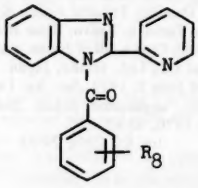
Reinhard Sarges, Old Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 186,446, Oct. 4, 1971, Pat. No. 3,751,428, which is a division of Ser. No. 714,416, March 20, 1968, Pat. No. 3,625,954. This application Apr. 9, 1973, Ser. No. 349,222

Int. Cl. C07d *31/44*

U.S. Cl. 260—295 B **2 Claims**

1. A compound selected from the group having the structural formula:



wherein R_8 is $-OCH_2CO_2H$.

3,864,352

MANUFACTURE OF BIPYRIDYLIUM SALTS

John Edward Colchester; John Francis Cairns, and John Gerard Carey, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, Millbank, London, England

Filed Dec. 5, 1969, Ser. No. 882,701

Claims priority, application Great Britain, Dec. 23, 1968, 61010/68

Int. Cl. C07d *31/44*

U.S. Cl. 260—295 AM **19 Claims**

1. A process for the manufacture of a 1,1' lower alkyl or carbamido lower alky-disubstituted-4,4'-bipyridylium salt which comprises forming the corresponding 1,1'-disubstituted-1,1'-dihydro-4,4'-bipyridyl by treating the corresponding 1,1'-disubstituted-1,1',4,4'-tetrahydro-4,4'-bipyridyl with an organic compound which has a redox potential in water more positive than -1.48 volts as compared with the saturated calomel electrode and which accepts a hydride ion removed from said tetrahydrobipyridyl to form an unstable anion which under the conditions of the reaction has a redox potential more negative than -0.45 volts as compared with the saturated calomel electrode, and subsequently oxidizing the resulting interaction product containing the said dihydrobipyridyl with an oxidizing agent selected from oxygen and an oxidizing agent which has a redox potential in water more positive than -0.50 volt as compared with the saturated calomel electrode.

3,864,353

1-(1-IMIDAZOLYL) (1,2,4) THIADIAZOLO (4,5-ALPHA) BENZIMADAZOLES

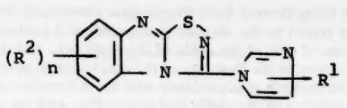
Rudiger D. Haugwitz, Titusville, and Venkatachala Lakshmi Narayanan, Hightstown, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 17, 1973, Ser. No. 425,448

Int. Cl. C07d *99/10*

U.S. Cl. 260—306.8 F **9 Claims**

1. A compound of the formula



wherein R^1 is hydrogen, lower alkyl, phenyl or substituted phenyl wherein the phenyl substituent is halo or nitro; R^2 is hydrogen, lower alkyl, nitro, halo or benzoyl; and n is 1 or 2.

3,864,354

BENZOXAZOLE AND OXADIAZOLE ULTRAVIOLET STABILIZERS

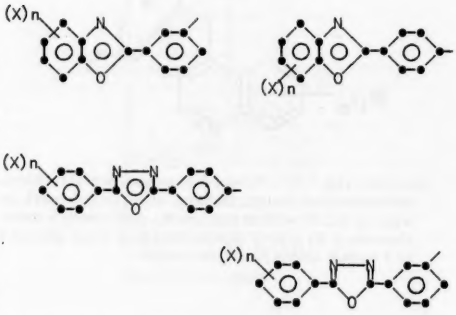
Gether Irick, Jr.; Charles A. Kelly, both of Kingsport, and James C. Martin, Johnson City, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 16, 1972, Ser. No. 298,040

Int. Cl. C07d *85/54*

U.S. Cl. 260—307 D **6 Claims**

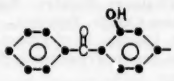
1. A composition of matter comprising compounds of segments A and B or A and C wherein segment A is of the structure:



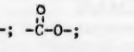
wherein X is meta or para to the heterocyclic ring and X may be the following:

C_6H_5, Cl, Br and lower alkyl,

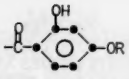
where n = 0-2; segment B is of the structure:



wherein the radical bond is either meta or para to the carbonyl group, A being linked through a group selected from



and segment C is of the structure



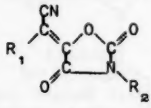
wherein R is CH_3 or $Cn'H_{2n'} + 1$, where $n' = 2–18$; A and C being linked through a carbon-carbon bond.

3,864,355
ANTIVIRAL
3-ARYL-5-(CYANOBENZYLIDENE)OXAZOLIDIENE 2,4-IONES

Ronald E. Hackler, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 23, 1973, Ser. No. 353,926
Int. Cl. C07d *85/34*
U.S. Cl. 260—307 B **6 Claims**

1. A compound of the formula,



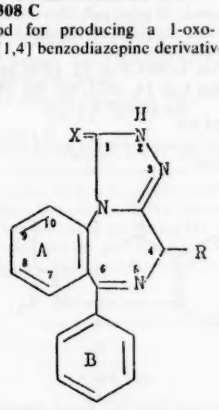
wherein R_1 is a monovalent aryl group selected from the group consisting of phenyl and p-chlorophenyl and R_2 is a monovalent aryl group selected from the group consisting of phenyl, p-chlorophenyl, and 1-naphthyl, with the limitation that when R_2 is 1-naphthyl, R_1 is phenyl.

3,864,356
METHOD FOR PREPARING S-TRIAZOLO (4,3-A) (1,4) BENZODIAZEPINE DERIVATIVES

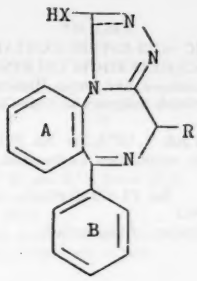
Kanji Meguro, and Yutaka Kuwada, both of Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 90,422, Nov. 17, 1970, abandoned. This application Feb. 5, 1973, Ser. No. 329,412
Claims priority, application Japan, Nov. 18, 1969, 44-92366
Int. Cl. C07d *57/02*
U.S. Cl. 260—308 C **2 Claims**

1. A method for producing a 1-oxo- or 1-thioxo-s-triazolo[4,3-a][1,4] benzodiazepine derivative of the formula

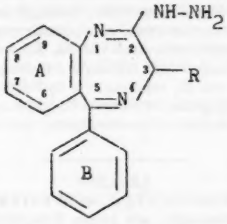


wherein rings A and B independently are unsubstituted or substituted by one or more members selected from the group consisting of halogen, nitro, trifluoromethyl, alkyl of up to 6 carbon atoms and alkoxy of up to 4 carbon atoms, R is hydrogen or lower alkyl and X is oxygen or sulfur, a corresponding 5N-oxide thereof or tautomer thereof of the formula



wherein rings A and B, R and X have the same meaning as defined above

which comprises reacting a 2-hydrazino-1,4-benzodiazepine derivative of the formula



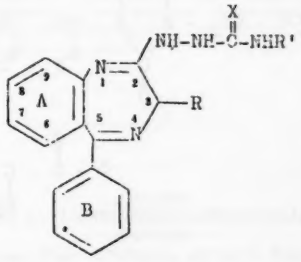
wherein rings A and B, and R have the same meaning as defined above, or a corresponding 4N-oxide thereof

with an isocyanic or isothiocyanic acid ester of the formula

R'NCX

wherein R' is a member selected from the group consisting of alkyl of 1–8 carbon atoms, cycloalkyl of 3–8 carbon atoms, phenyl, naphthyl and phenyl lower alkyl, and X has the same meaning as defined above

and heating the resultant 2-(4-substituted semicarbazido) or 2-(4-substituted thiosemicarbazido)-1,4-benzodiazepine derivative of the formula



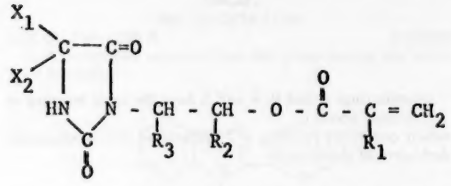
wherein rings A and B, R, R' and X have the same meaning as defined above, or a corresponding 4N-oxide thereof, to a temperature of from about 120° to 250°C to cause cyclization thereof.

3,864,357
ACRYLIC ACID ESTERS CONTAINING A N,N-HETEROCYCLIC RING

Daniel Porret, Binningen, and Jurgen Habermeier, Pfeffingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 9, 1973, Ser. No. 377,698
Claims priority, application Switzerland, July 12, 1972, 10424/72
Int. Cl. C07d 49/32
U.S. Cl. 260—309.5 10 Claims

1. Acrylic acid esters of the formula



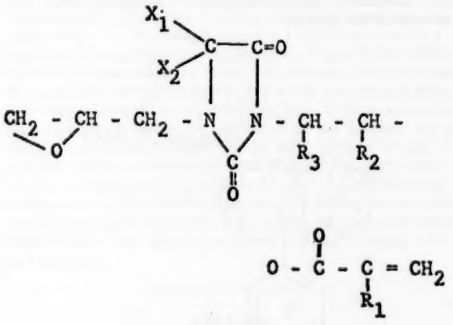
wherein X_1 and X_2 each represent a hydrogen atom or an alkyl radical with 1–4 carbon atoms or together represent the tetramethylene or pentamethylene radical, R_1 and R_3 independently of one another each represent a hydrogen atom or the methyl group and R_2 represents a hydrogen atom or the methyl or phenyl group, or wherein R_2 and R_3 together represents the trimethylene or tetramethylene radical.

3,864,358
EPOXY-ACRYLIC ACID ESTERS

Daniel Porret, Binningen, and Jurgen Habermeier, Pfeffingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 9, 1973, Ser. No. 377,699
Claims priority, application Switzerland, July 12, 1972, 10425/72
Int. Cl. C07d 49/32
U.S. Cl. 260—309.5 6 Claims

1. Epoxyacrylic acid esters of the formula



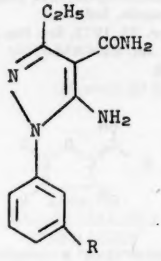
wherein X_1 and X_2 each represent a hydrogen atom or an alkyl radical with 1–4 carbon atoms or together represent the tetramethylene or pentamethylene radical, R_1 and R_3 independently of one another each represent a hydrogen atom or the methyl group and R_2 represents a hydrogen atom, the methyl or phenyl group, or where R_2 and R_3 together represent the trimethylene or tetramethylene radical.

3,864,359
5-AMINO-3-ETHYL-1-PHENYL-4-PYRAZOLECARBOXAMIDES AND METHOD OF PREPARATION THEREOF

Joseph William Marsico, Jr., Pearl River, N.Y.; Joseph Peter Joseph, Cliffside Park, N.J., and Leon Goldman, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 248,990, May 1, 1972, Pat. No. 3,760,082. This application May 3, 1973, Ser. No. 356,979
Int. Cl. C07d 49/20
U.S. Cl. 260—310 R 5 Claims

1. A pyrazolecarboxamide of the formula:



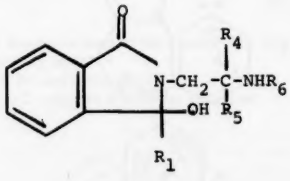
wherein R is hydrogen, chloro or fluoro, or non-toxic acid addition salt thereof.

3,864,360
N-(2-[3-HYDROXY-3-PHENYL-2-PHTHALIMIDINYL]-ETHYL)-SULFONAMIDES

Theodore S. Sulkowski, Wayne, and Albert A. Mascitti, Norristown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 10,984, Feb. 12, 1970, abandoned. This application Aug. 14, 1972, Ser. No. 280,634
Int. Cl. C07d 27/50
U.S. Cl. 260—325 PH 7 Claims

1. A compound selected from the group consisting of those having the formula:



wherein R_1 is selected from the group consisting of phenyl, monohalophenyl, dihalophenyl, mono(lower)alkylphenyl, di(lower)alkylphenyl, trifluoromethylphenyl, mono(lower)alkoxyphenyl, diOlower)alkoxyphenyl; R_4 and R_5 are selected from the group consisting of hydrogen and lower alkyl; R_6 is selected from the group consisting of lower alkylsulfonyl, phenylsulfonyl, monohalophenylsulfonyl, dihalophenylsulfonyl, mono(lower)alkylphenylsulfonyl, di(lower)alkylphenylsulfonyl and lower alkoxyphenylsulfonyl.

3,864,361

STEREOSPECIFIC HYDROGENATION PROCESS USING UNSUPPORTED RUO_2 CATALYST

Neil W. Stillman, Madison, and Edmond R. Osgood, Mentor, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 15, 1973, Ser. No. 332,721
Int. Cl. C07d 27/04
U.S. Cl. 260—326.8 5 Claims

1. A process for hydrogenating 2,5-dimethylpyrrole to 2,5-dimethylpyrrolidine which consists essentially of contacting said 2,5-dimethylpyrrole at a temperature of 75°–160° C and under a hydrogen pressure of 200–1,000 psig with from about 0.2 to 0.8 %, by weight of the 2,5-dimethylpyrrole, of an unsupported ruthenium dioxide as the sole hydrogenation catalyst, said ruthenium dioxide having an average crystallite size ranging up to about 1,000 A, and recovering the saturated 2,5-dimethylpyrrolidine product predominantly in cis-isomer form.

3,864,362

ISO FLAVONES

Laszlo Feuer; Mihaly Nogradi; Agnes Gottsegen; Borbala Vermes; Janos Streliszky; Andras Wolfner; Lorant Farkas; Sandor Antus; Maria Kovacs, and Nee Toth, all of Budapest, Hungary, assignors to Chinoin Gyogyszer-Es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Continuation-in-part of Ser. No. 146,773, May 25, 1971, Pat. No. 3,833,730. This application June 27, 1973, Ser. No. 374,056
Claims priority, application Hungary, May 27, 1970, C1-996
Int. Cl. C07d 7/32
U.S. Cl. 260—345.2 5 Claims

1. The catabolic and anorexigenic compound 7-isobutoxy-isoflavone.

3,864,363

FURAN PURIFICATION

Glenn F. Kile, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 10, 1973, Ser. No. 377,990
Int. Cl. C07d 5/14
U.S. Cl. 260—346.1 R 10 Claims

1. A method for pretreating a bed of base treated zinc oxide before said bed is placed into adsorption service to selectively adsorb contaminants from a furan-containing stream which comprises cycling a fluid stream of dry furan through said bed of adsorbent while gradually increasing the temperature and pressure of said fluid stream until said bed of adsorbent is dry, and then placing said bed into adsorption service.

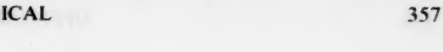
3,864,364

AZIDES

Clive A. Henrick, Palo Alto, Calif., and Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 310,749, Nov. 30, 1972,. This application Mar. 25, 1974, Ser. No. 454,193
Int. Cl. C07c 117/00
U.S. Cl. 260—349 4 Claims

1. A compound selected from those of the following formula (II)



(II)

wherein,
each of R^1, R^2, R^3 and R^4 is lower alkyl;
R^{14} is hydrogen or methyl;
R^5 is lower alkyl;
m is zero or the positive integer one; and
n is the positive integer one or two.

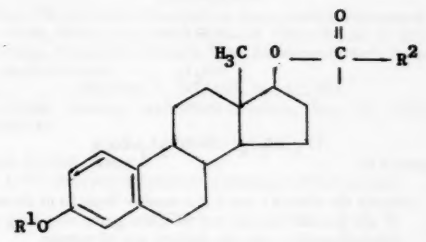
3,864,365

CARBONIC ACID DERIVATIVES OF ESTRADIOL AND PROCESSES FOR THEIR PRODUCTION

Peter Grosse; Kurt Ponsold; Richard Prousa; Ralf Schnabel, and Jutta Von Zychlinski, all of Jena, Germany, assignors to Veh Venapharm Jena, Jena, Germany

Filed July 27, 1973, Ser. No. 383,445
Int. Cl. C07c 169/20
U.S. Cl. 260—397.5 40 Claims

1. A carbonic acid derivative of estradiol having the following formula:



in which R^1 is a hydrogen or methyl radical, and R^2 is a chlorine, amino, methylamino, ethylamino, benzylamino, cyclohexylamino, dimethylamino, diethylamino, phenylamino, p-tolylamino, p-hydroxphenylamino, 2,2-dimethylhydrazino, isopropylidenehydrazino, p-tolylsufonamido, ethylmercapto, phenylmercapto, 2-cyanoisopropoxy, propargyloxy, phenoxy, p-methoxyphenoxy, p-nitrophenoxy, 8-quinolyloxy, azido, cyano, isopropylideneaminooxy, isothioureido, or N,N-diethylaminoethoxy radical.

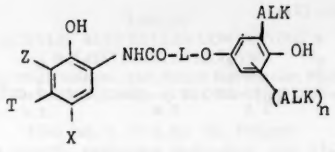
3,864,366

NOVEL ACYLAMIDOPHENOL PHOTOGRAPHIC COUPLERS

Philip T. Lau; Ilmari F. Salminen, and Leo E. Beavers, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 213,812, Dec. 29, 1971, abandoned. This application June 14, 1973, Ser. No. 370,111
Int. Cl. C07c 103/30
U.S. Cl. 260—404 12 Claims

1. A compound of the formula



wherein:
n is 0–1
L is a divalent alkylene group of 10–20 carbon atoms;
ALK is an alkyl group of 1–8 carbon atoms;
X is (1) hydrogen, (2) a halo group, (3) an alkoxy group, or (4) a phenylthio group,
T is (1) a halo group, (2) an alkyl group or (3) an alkoxy groupl and
Z is individually defined as in T.

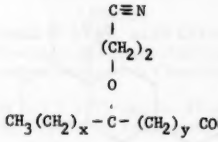
3,864,367

DIFUNCTIONAL FATTY SOAP BASED GREASES

Harold E. Kenney, Jenkintown; Edward T. Donahue, Philadelphia, and Gerhard Maerker, Oreland, all of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 25, 1972, Ser. No. 275,011
Int. Cl. C08h *17/36*
U.S. Cl. 260—404 **14 Claims**

1. A difunctional fatty soap of the general formula



wherein the sum of *x* and *y* is a number from 10 to 20 and R is a metallic ion selected from the group consisting of lithium, sodium, calcium, barium, and aluminum.

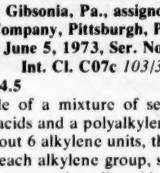
3,864,368

POLYAMIDE OF A MIXTURE OF SECONDARY AND TERTIARY MONOCARBOXYLIC ACIDS

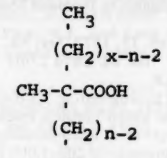
Robert J. Hartle, Gibsonia, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed June 5, 1973, Ser. No. 367,180
Int. Cl. C07c *103/30*
U.S. Cl. 260—404.5 **11 Claims**

1. A polyamide of a mixture of secondary and tertiary monocarboxylic acids and a polyalkylene polyamine containing about 2 to about 6 alkylene units, there being from 2 to 4 carbon atoms in each alkylene group, said mixture of secondary and tertiary monocarboxylic acids falling within each of the following general structures



wherein *x* is a number from 18 to 30 and *n* is the integer 2, 3 4 up to *x*/2 for even integers between 18 and 30 and 2, 3, 4 up to (*x*+1)/2 for odd integers between 18 and 30, and



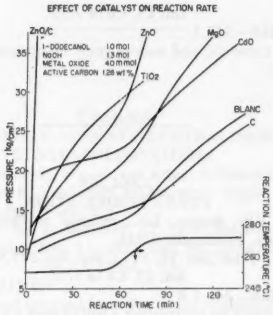
wherein *x* is a number from 18 to 30 and *n* is the integer 2, 3, 4 and to *x*/2 for even integers between 18 and 30 and 2, 3, 4 up to (*x*+1)/2 for odd integers between 18 and 30, said polyamide containing about 1 to about 3 amine groups in addition to amide groups.

3,864,369

METHOD OF PREPARING CARBOXYLIC ACID SALTS

Hiroshi Isa, Funabashi-shi; Takeo Inagaki, Narashino-shi; Takeshi Takemoto, Ichikawa-shi, and Kazuo Endoh, Tokyo, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1971, Ser. No. 138,984
Claims priority, application Japan, May 9, 1970, 45-39528
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 **8 Claims**



1. A process for preparing carboxylic acid salt from alcoholic oxygen-containing organic reactant selected from the group consisting of primary alcohols, aldehydes, aldols, esters, alkanolamines and aluminum alcoholates, comprising reacting said alcoholic oxygen-containing organic reactant with an alkali metal compound selected from the group consisting of alkali metal oxides and hydroxides, under oxidative dehydrogenation conditions of a temperature in the range of 150° to 350°C and a pressure in the range of 2 to 100 atmospheres, in the presence of from 0.01 to 10% by weight, based on the weight of said alcoholic oxygen-containing reactant, of catalyst consisting essentially of a mixture of (a) at least one member selected from the group consisting of zinc, copper, the oxides of metals of Group IB, Group II and Group IV of the Periodic Table, zinc chloride and zinc hydroxide, and (b) solid carbon having a surface area in the range of from 25 to 1,700 m^2/g, the weight ratio of (a):(b) being in the range of about 100:1 to 1:100.

3,864,370

METHOD OF REFINING CRUDE SYNTHETIC FATTY ACIDS

Takashi Yamashita, and Sadayoshi Ninagawa, both of Kanagawa, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Aug. 2, 1972, Ser. No. 277,239
Claims priority, application Japan, Aug. 6, 1971, 46-59425
Int. Cl. C09f 5/10
U.S. Cl. 260—419 4 Claims

1. A method of purifying crude fatty acid produced by oxidation of paraffin and essentially consisting of pure fatty acid and, as contaminants, ester of said fatty acid and at least one member of the group consisting of estolide, alcohol, lactone, and hydroxycarboxylic acid, which method comprises:

a. holding a liquid phase essentially consisting of said crude fatty acid in contact with a solid catalyst at 150° to 350°C until the amount of said ester is substantially decreased, whereby said fatty acid is purified,

1. said catalyst being insoluble in said crude fatty acid and inert to said pure fatty acid at said temperature,

2. said catalyst essentially consisting of oxide of at least one member of the group consisting of aluminum, silicon, titanium, and zirconium; and

b. separating the purified fatty acid from said catalyst.

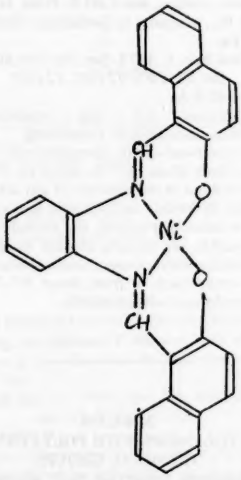
3,864,371

BISAZOMETHINE PIGMENT AND PROCESS FOR ITS MANUFACTURE

Eric Richard Inman, Bridge of Weir; James McGeachie McCrae, Stewarton; Christopher Midcalf, Kilbarchan, and Alison Turner, Houston by Johnstone, all of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 20, 1973, Ser. No. 333,598
Claims priority, application Great Britain, Feb. 24, 1972, 8517/72
Int. Cl. C07f 15/04
U.S. Cl. 260—439 R 8 Claims

1. A compound having the formula:



in the pigmentary form in which it has an orange-red colour and has an X chromaticity co-ordinate of from 0.59 to 0.63 and a Y chromaticity of from 0.33 to 0.36.

3,864,372

PROCESS FOR THE PRODUCTION OF UNSATURATED ORGANOSILICON COMPOUNDS

Petr Svoboda; Vera Vaisarova; Martin Capka; Jiri Hetflejs; Milos Kraus, and Vladimir Bazant, all of Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie ved, Prague, Czechoslovakia

Filed Dec. 1, 1972, Ser. No. 311,270
Claims priority, application Czechoslovakia, Dec. 10, 1971, 8523-71; Dec. 16, 1971, 8758-71; Mar. 2, 1972, 1362-72; Mar. 29, 1972, 2102-72
Int. Cl. C07f 7/08
U.S. Cl. 260—448.2 E 7 Claims

1. A process for the production of unsaturated organosilicon compounds which comprises contacting a silicon compound containing one hydrogen atom attached to silicon per molecule, with a dienic hydrocarbon containing conjugated C=C double bonds and having from four to eight carbon atoms per molecule in the presence of a palladium complex selected from the group consisting of

L_2PdX_2, $L_2{}^1PdX_2$, L^3PdXCl_2, and $(\pi—C_3H_5)PdCl/_2$

where L is a member selected from the group consisting of tertiary phosphines having at least one phenyl group attached to phosphorus per molecule, X is a member selected from the group consisting of halogens, L^1 is benzonitrile, L^3 is 1,2-bis(triphenylphosphine) ethane or 1,2-bis(cyanomethyl)benzene, and where $\pi—C_3H_5$ is a pi-allyl group.

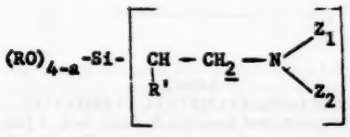
3,864,373

MANUFACTURE OF TRIALKOXYSILYLAMINO COMPOUNDS

Claus-Dietrich Seiler, Rheinfelden; Hans-Joachim Vahlensieck, Wehr, Baden, and Peter Gerhardt, Oberwihl, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Dec. 7, 1972, Ser. No. 313,074
Claims priority, application Germany, Dec. 13, 1971, 2161716
Int. Cl. C07f 7/10, 7/18
U.S. Cl. 260—448.8 R 14 Claims

1. An alkoxysilylethylamino compound of the formula



in which a is 1, 2 or 3, R represents a lower substituted or unsubstituted alkyl radical of one to eight carbon atoms, R′ represents a substituted or unsubstituted alkyl radical of one to eight carbon atoms, Z_1 and Z_2 each represent hydrogen or alkyl, alkenyl, cycloalkyl $—CH_2CH_2—NH_2$ or phenyl radicals.

3,864,374

MANUFACTURE OF ALKALI METAL XANTHATES

Chu-jen Chia, Brossard, Quebec; Jack Ellwood Currah, Poin-Te-Claire, Quebec, and George Russell Lusby, Mont-Saint-Hilaire, Quebec, all of Canada, assignors to Canadian Industries, Limited, Quebec, Canada

Filed Nov. 19, 1973, Ser. No. 416,753
Int. Cl. c07c 154/02
U.S. Cl. 260—455 B 7 Claims

1. A process for the manufacture of alkali metal xanthates comprising the steps of

1. contacting an alkali metal hydroxide with a stoichiometric excess of carbon disulphide and of an aliphatic alcohol having two to six carbon atoms in the molecule, the carbon disulphide and alcohol being in the gas phase and in admixture with an inert gas, at a temperature in the range

50° C. to 120° C., thus bringing about a reaction between the alkali metal hydroxide, carbon disulphide and alcohol to form solid alkali metal xanthate and water vapour, and 2. separating the gaseous mixture of unreacted carbon disulphide, unreacted alcohol, by-product water vapour and inert gas from the solid alkali metal xanthate.

3,864,375

THIN-FILM TYPE SULFONATION PROCESS

Kyozo Kitano, Ichikawa; Junichi Nakayama, Tokyo, and Sadao Toyoda, Funabashi, all of Japan, assignors to Lion Fat & Oil, Ltd., Tokyo, Japan

Filed Apr. 20, 1973, Ser. No. 352,911
Claims priority, application Japan, Apr. 28, 1972, 47-42794
Int. Cl. C07c *139/00, 143/06*
U.S. Cl. 260—459 **5 Claims**

1. In a process for effecting the thin film sulfonation of organic sulfonateable material, in which a feed stream of organic material is flowed in the form of a thin film along a reaction surface having a length of about 0.5 to 3 meters, and is contacted with a gaseous stream of SO_3 and inert gas wherein the SO_3 concentration is in the range of about 1 to 8 vol. %, and the reaction temperature is in the range of about 30° to 60° C, the improvement which comprises:

employing as the feedstream a mixture consisting essentially of (1) a sulfonatable material selected from the group consisting of olefins having 12 to 22 carbon atoms and fatty alcohols having 8 to 22 carbon atoms, and (2) from 30 to 10,000 ppm by weight, based on the weight of (1), of a non-ionic surface active agent selected from the group consisting of (a) ethylene oxide or propylene oxide adducts of higher fatty alcohols, alkylphenols, fatty acids and fatty acid amides, (b) fatty acids diethanolamides and (c) fatty acid esters of glycerol, sorbitan, sorbitol and sucrose.

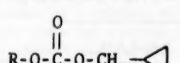
3,864,376

CYCLOPROPYLMETHYL CARBONATES

Clive A. Henrick, and Gerardus B. Staal, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Apr. 30, 1973, Ser. No. 355,845
Int. Cl. C07c *69/00, 154/00;* **A01n** *9/24*
U.S. Cl. 260—463 **6 Claims**

1. A compound of the formula A

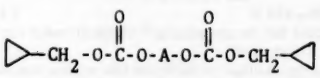


(A)

wherein,

R is alkyl of ten to 16 carbon atoms or aryl or aralkyl or six to 10 carbon atoms.

5. A compound of formula B



(B)

wherein,

A is alkylene, alkenylene or alkynylene of two to 10 carbon atoms.

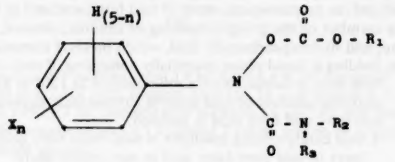
3,864,377

ARYL UREA CARBONATES

John Krenzer, Oak Park, and Sidney B. Richter, Chicago, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jan. 3, 1968, Ser. No. 695,338
Int. Cl. C07c *69/00*
U.S. Cl. 260—463 **6 Claims**

1. A compound of the formula



wherein each X is independently selected from the group consisting of halogen, lower alkyl, lower alkenyl, lower haloalkyl, nitro, lower alkoxy and lower alkylthio; n is an integer from 0 to 3; R_1 is selected from the group consisting of lower alkyl, lower alkenyl, and lower haloalkyl; and R_2 and R_3 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, and lower haloalkyl. 2. The compound of claim 1, 1-(3,4-dichlorophenyl)-1-methoxycarbonyloxy-3-methylurea.

3,864,378

PROCESS FOR PREPARING 2-HYDROXYETHYLIMINODIACETONITRILE

Otto A. Homberg, Easton, and Carl E. Fries, Jr., Northhampton, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Feb. 5, 1973, Ser. No. 329,803
Int. Cl. C07c *121/02, 121/42*
U.S. Cl. 260—465.5 A **10 Claims**

1. A process for the synthesis of 2-hydroxyethyliminodiacetonitrile comprising:

reacting monoethanolamine, formaldehyde and hydrogen cyanide at from about pH 7 to about pH 9, said reaction being carried out in the absence of any alkali or alkaline earth metal hydroxide and wherein said reaction is carried out in aqueous medium, the formaldehyde and hydrogen cyanide are initially present in about 30 to 50 percent stoichiometric excess, and said reaction is carried out at a temperature of from about 40°–70° C to form 2-hydroxyethyliminodiacetonitrile.

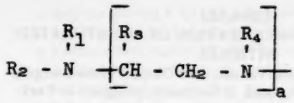
3,864,379

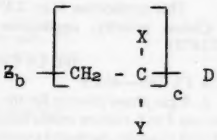
ADDITION POLYMERS WITH POLYETHYLENIMINE TERMINAL GROUPS

Darrell R. Thompson, Somerville, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 776,751, Nov. 18, 1968, abandoned. This application Apr. 5, 1972, Ser. No. 241,400
Int. Cl. C07c *121/34, 121/42*
U.S. Cl. 260—465.4 **9 Claims**

1. A polymeric material of the formula



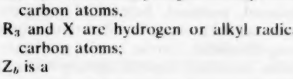


where

R_1, R_2 and R_4 are hydrogen or alkyl radicals of 1 through 4 carbon atoms,

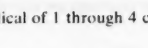
R_3 and X are hydrogen or alkyl radicals of 1 through 4 carbon atoms;

Z_b is a



radical;

Y is an alkyl radical of 1 through 4 carbon atoms, halogen,



or

where

R is an alkyl radical of one through 18 carbon atoms;

D is hydrogen;

a is a number 1 through 2000;

b is 0 or 1;

and

c is a number 5 through 5000;

the *c*/*a* quotient being greater than 1.

3,864,380

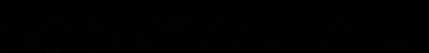
HYDROCYANATION OF OLEFINS

Charles M. King, and Michael T. Musser, both of Wilmington, Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Jan. 17, 1974, Ser. No. 434,020
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.8 R **5 Claims**

1. In a process of hydrocyanating a nonconjugated unsaturated organic compound containing from two to 20 carbon atoms and having at least one olefinic carbon-carbon double bond, the unsaturated organic compound being selected from the group consisting of

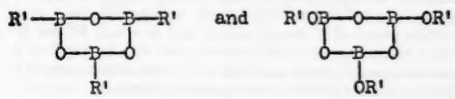
a. monoolefinic aliphatic and aromatic hydrocarbons and monoolefinic aliphatic and aromatic hydrocarbons containing a functional group of the group consisting of —CN, —OR″,



and —NR″$_2$ wherein R″ is selected from the group consisting of hydrogen, alkyl and aryl radicals having up to 10 carbon atoms and each open bond other than that required for connection of the functional group to the olefinic radical is connected to a radical of the group consisting of hydrogen, aliphatic, and aromatic hydrocarbon radicals, wherein the carbon-carbon double bond is separated from the aforesaid functional group by at least one carbon atom, and

b. polyolefinic aliphatic hydrocarbons wherein the carbon-carbon double bonds are separated from each other by at least one carbon atom, by contacting the unsaturated organic compound with hydrogen cyanide in the presence of a nickel catalyst consisting essentially of a zerovalent nickel complex of the group consisting of Ni(PXYZ)$_4$, N-bonded nitrile complexes of the formula Ni(PXYZ)$_3$R^{2}CN and olefin-bonded complexes of the formula Ni(PXYZ)$_2$A wherein X is OR, Y and Z are R or OR and R is of the group consisting of alkyl and aryl radicals of up to 18 carbon atoms, wherein the R radicals of a given PXYZ ligand of Ni(PXYZ)$_4$, Ni(PXYZ)$_3$R^{2}CN and Ni(PXYZ)$_2$A may be the same or different, wherein the R radicals of a given PXYZ ligand of Ni(PXYZ)$_3$R^{2}CN and Ni(PXYZ)$_2$A are so chosen that the ligand has a cone angle of 130° to 170°, wherein R^2 is of the group consisting of alkyl, alkenyl, cyanosubstituted alkyl and aryl radicals having one to 20 carbon atoms and when R^2 is alkenyl the carbon-carbon double bond of the alkenyl radical is separated from the nitrile functional group by at least one carbon atom, wherein A is an unsaturated organic compound of the groups set forth under (a) and (b) above,

the improvement which comprises carrying out the hydrocyanation in the presence of a boron compound of the group consisting of $(R'_2B)_2O$, $R'B(OH)_2$, R'_2BOH and



wherein R′ is an hydrocarbyl alkyl or aryl radical having one to 10 carbon atoms, wherein the mole ratio of boron compound to the nickel catalyst is in the range of 0.1:1.0 to 5.0:1.0 wherein the mole ratio of unsaturated compound to nickel catalyst is in the range of about 1:5 to 2000:1, at a temperature in the range of −50° to 200° C. and recovering the hydrocyanated organic compound.

3,864,381

RECOVERY OF DICYANOBUTENE FROM DICYANOBUTENE PROCESS BRINE

Alvin C. Vaught, Victoria, Tex., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 15, 1973, Ser. No. 388,649
Int. Cl. C07c *121/20*
U.S. Cl. 260—465.8 R **6 Claims**

1. A process for recovering dicyanobutene from a process brine resulting from reaction of dichlorobutene with sodium cyanide and sodium cuprocyanide catalyst in an aqueous medium and acidification of the aqueous medium with hydrochloric acid to precipitate and reclaim the catalyst which comprises

a. contacting the brine with granular activated carbon to adsorb dicyanobutene contained in the brine

b. contacting the carbon on which the dicyanobutene is adsorbed with at least a volume equal to the granular activated carbon of a steam distillable organic liquid at a

temperature in the range of about 20° C. to the boiling point of the organic liquid, the organic liquid having a boiling point in the range of about 80° to 175° C. and being one in which the dicyanobutene is soluble to the extent of at least one percent by weight at 25° C., to remove the adsorbed dicyanobutene from the carbon,

c. separating the granular activated carbon from the organic liquid containing the dicyanobutene and

d. recovering the dicyanobutene from the organic liquid.

3,864,382
PROCESS FOR THE PREPARATION OF NITRILES CONTAINING AMINO GROUPS

Helmut aus der Funten, Mondorf, and Hermann Richtzenhain, Schwellenbach, both of Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

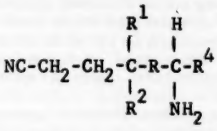
Filed Feb. 12, 1970, Ser. No. 11,020

Claims priority, application Germany, Feb. 26, 1969, 1908466

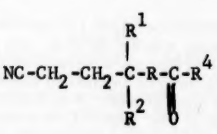
Int. Cl. C07c *121/42, 121/78*

U.S. Cl. 260—465 E **5 Claims**

1. In the process for the preparation of amino-group-containing nitriles of the general formula

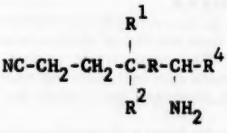


wherein R is $-CH_2CHR^3-$, R^1 and R^2 are alkyl having 1 to 4 carbon atoms, R^3 is hydrogen or an alkyl having 1–4 carbon atoms, and R^4 is a hydrogen atom, an alkyl having 1 to 4 carbon atoms or a phenyl radical, and in which R^3 and R^4 when taken together form a carbocyclic ring having 5 or 6 carbon atoms, by hydrogenating in the fluid state a carbonyl-group-containing nitrile of the general formula



in which R is $CH=CR^3$ or CH_2-CHR^3 and R^1-R^4 have the above-given meaning at a temperature of about 60°–180°C, at a hydrogen pressure of at least about 50 atmospheres gauge, and with the addition of an at least stoichiometric quantity of ammonia; the improvement comprising catalyzing the aminative reduction with at least one member selected from the group consisting of platinum and palladium.

5. An amino nitrile of the formula:



wherein

R is CH_2-CH_2-,

R^1 and R^2 are each methyl

and R^4 is phenyl.

3,864,383
PROCESS FOR THE PREPARATION OF UNSATURATED NITRILES

Hans Fernholz, Fischbach/Taunus, and Dieter Freudenberger, Diedenbergen/Taunus, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister & Bruning, Frankfurt am Main, Germany

Continuation of Ser. No. 218,507, Jan. 17, 1972, abandoned. This application Mar. 23, 1973, Ser. No. 344,161

Claims priority, application Germany, May 19, 1971, 2124755

Int. Cl. C07c *12/04*

U.S. Cl. 260—465.9 **9 Claims**

1. A gas phase process for the preparation of olefinic nitriles having 3 to 6 carbon atoms selected from the group consisting of allyl cyanide, methallyl cyanide, butenyl cyanide and pentenyl cyanide, from hydrocyanic acid and esters of unsaturated alcohols having 2 to 5 carbon atoms, said unsaturated alcohols being selected from the group consisting of allyl alcohol, methallyl alcohol, butenol, pentenol, butenediol and pentadienol and carboxylic acids having 1 to 10 carbon atoms selected from the group consisting formic, acetic, propionic, butyric, valeric, caproic, enanthic, caprylic, pelargonic and capric acid, wherein the reactants are passed at a temperature from 50° to 350°C and under a pressure of from 0.5 to 50 atmospheres absolute, over a supported catalyst consisting essentially of from 5 to 40 percent by weight of total catalyst, of a compound selected from the group consisting of the chlorides, bromides, nitrates, cyanides, sulfates and acetates of bivalent copper or bivalent cobalt or mixtures thereof and wherein an auxiliary agent selected from the group consisting of hydrogen chloride, water, molecular oxygen, gases containing molecular oxygen and mixtures thereof, are passed either simultaneously with the reactants or alternatively therewith over the said catalyst.

3,864,384
SUBSTITUTED PHENYLACETIC ACID COMPOUNDS

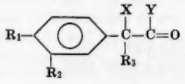
Julius Diamond, Lafayette Hill, and Norman J. Santora, Roslyn, both of Pa., assignors to William H. Rorer Inc., Fort Washington, Pa.

Filed May 5, 1970, Ser. No. 34,870

Int. Cl. C07c *63/32, 69/62*

U.S. Cl. 260—469 **16 Claims**

1. A substituted phenylacetic acid compound selected from the group consisting of a substituted phenylacetic acid compound of the formula



wherein

R_1 is a member selected from the group consisting of cycloalkyl with 5 to 7 carbon atoms and lower alkyl substituted cycloalkyl;

R_2 is a member selected from the group consisting of halogen, nitro, cyano, trifluoromethyl and lower alkylsulfonyl;

R_3 is hydrogen;

X is halogen;

Y is hydroxyl;

the lower alkyl members in said formula being lower alkyl with 1 to 8 carbon atoms;

and the substantially non-toxic, pharmaceutically acceptable esters and salts of said substituted phenylacetic acid compounds of the above given formula; said esters being selected from the group consisting of those formed from

a lower aliphatic alcohol having 1 to 8 carbon atoms;

an alicyclic alcohol having 6 to 14 carbon atoms;

a terpene having 6 to 14 carbon atoms,
a hydrocarbon aryl alcohol having 6 to 14 carbon atoms,
a hydrocarbon aralkyl alcohol having 7 to 14 carbon atoms, and a heterocyclic alcohol selected from the group consisting of furfuryl alcohol, piperidinoethanol, pyrrolidinoethanol and piperazinoethanol; and said salts being selected from the group consisting of
an alkali metal salt,
an alkaline earth metal salt,
an ammonium salt,
a di-lower alkyl ammonium salt,
a hydroxy lower alkylammonium salt,
a piperazinium salt,
a piperidinium salt, and
a lower alkyl benzylammonium salt.

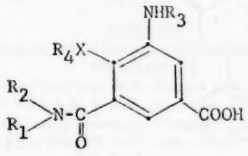
3,864,385

NEW 5-AMINOISOPHTHALIC ACID DERIVATIVES, SALTS AND ESTERS THEREOF AND METHODS FOR THEIR PREPARATION

Peter Werner Feit, and Herta Bruun, both of Graested, Denmark, assignors to Lovens Kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark

Filed Sept. 27, 1972, Ser. No. 292,525
Claims priority, application Great Britain, Oct. 5, 1971, 46291/71; Dec. 14, 1971, 58100/71
Int. Cl. C07c *149/42*
U.S. Cl. 260—470 **7 Claims**

1. Compounds of the general formula I



I

in which X is —S—; R_1 is selected from the group consisting of hydrogen and aliphatic hydrocarbon radicals with from one to four carbon atoms; R_2 is selected from the group consisting of hydrogen, saturated and unsaturated, straight and branched aliphatic hydrocarbon radicals with from one to six carbon atoms; R_3 is selected from the group consisting of saturated and unsaturated, straight and branched aliphatic hydrocarbon radicals with from one to six carbon atoms, and aryl substituted aliphatic hydrocarbon radicals with from one to four carbon atoms, and R_4 is a phenyl radical; and pharmaceutically acceptable salts and lower alkyl esters of these compounds.

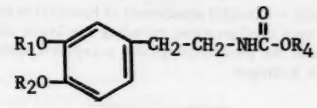
3,864,386

DI-SUBSTITUTED BETA-PHENETHYLCARBBAMIC ACID ESTERS

John Hans Biel, Lake Bluff, Ill., and Irwin L. Klundt, Brookfield, Wis., assignors to Aldrich Chemical Company, Milwaukee County, Wis.

Division of Ser. No. 96,586, Dec. 9, 1970, Pat. No. 3,801,624.
This application Aug. 2, 1973, Ser. No. 385,008
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C **4 Claims**

1. A compound of the formula



wherein R_1 is hydrogen or

R_3 being loweralkyl, loweralkenyl or loweralkynyl; R_2 is

and R_4 is loweralkyl, loweralkenyl, loweralkynyl, lowerhaloalkyl or cyclopropylmethyl, with the limitation that each R_3 cannot be ethyl when R_4 is ethyl.

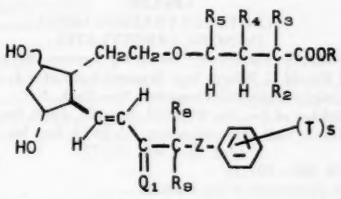
3,864,387

5-OXA PHENYL-AND PHENOXY-SUBSTITUTED PROSTAGLANDIN F_1 ANALOGS

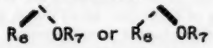
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 21, 1973, Ser. No. 361,990
Int. Cl. C07c *61/32, 63/60, 69/71*
U.S. Cl. 260—473 A **22 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 6 carbon atoms, inclusive, between $—CR_8R_9—$ and the ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_{10}$, wherein R_{10} is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; wherein Q_1 is



wherein R_6 and R_7 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein when Z is oxa (—O—), R_8 and R_9 are hydrogen or alkyl of one to 4 carbon atoms, being the same or different, and, when Z is C_jH_{2j}, R_8 and R_9 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that R_9 is fluoro only when R_8 is hydrogen or fluoro; wherein R_3 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, wherein R_2 is hydrogen or fluoro, with the proviso that R_2 is fluoro only when R_3 is hydrogen or fluoro; and wherein R_4 and R_5 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different, with the proviso that no more than one of R_3, R_4, and R_5 is alkyl;

and wherein ~ indicates attachment of hydroxyl to the ring in alpha or beta configuration; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,864,388

ALKYNYL ESTERS OF α-ALKOXY-α-PHENYL ALKENOIC ACID

Shigeyoshi Kitamura; Yositosi Okuno, both of Toyonaka, and Masachika Hirano, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

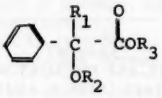
Filed Dec. 13, 1971, Ser. No. 207,542

Claims priority, application Japan, Dec. 29, 1970, 45-124365; Aug. 6, 1971, 46-59784; Aug. 16, 1971, 46-62412

Int. Cl. C07c *69/76*

U.S. Cl. 260—473 A **3 Claims**

1. A compound of the formula,



wherein R_1 is a C_{2-6} alkenyl, R_2 is a C_{1-6} alkyl, and R_3 is terminally unsaturated C_{3-6} alkyl.

3,864,389

N-(2-HYDROXYHYDROCARBYL) IMINODICARBOXYLATES

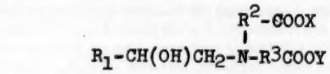
Bjorn Sundby, Piscataway; Edward J. Kenney, Bernardsville, and Harold E. Wixon, New Brunswick, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 880,992, Nov. 28, 1969, Pat. No. 3,725,473. This application Jan. 17, 1973, Ser. No. 324,314

Int. Cl. C07c *101/72*

U.S. Cl. 260—501.11 **5 Claims**

1. A compound of the formula



wherein R^1 is alkyl of 12 to 20 carbon atoms, or alkenyl of 12 to 20 carbon atoms containing one or two ethylene double bonds, R^2 and R^3 are alkylene or arylene of 1 to 9 carbon atoms and at least one of R^2 and R^3 is arylene and X and Y which may be the same or different are selected from the group consisting of hydrogen, alkali metal, ammonium, monoalkylamine, dialkylamine, trialkylamine, monoalkanolamine, dialkanolamine and trialkanolamine, in which the alkyl and alkanol groups are of 1 to 4 carbon atoms.

3,864,390

1-FORMYLPHENOXY-3-AMINO-2-PROPANOL DERIVATIVES

David J. Le Count, and Christopher John Squire, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

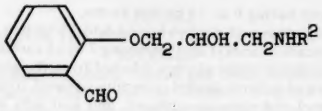
Filed June 29, 1972, Ser. No. 267,535

Claims priority, application Great Britain, July 28, 1971, 35480/11

Int. Cl. C07c *95/08*

U.S. Cl. 260—501.17 **3 Claims**

1. An alkanolamine derivative selected from a compound of the formula:



where R^2 is isopropyl, s-butyl, or t-butyl, and a hydrochloride; hydrobromide, phosphate, sulphate, oxalate, lactate, tartrate, acetate, salicylate, citrate, benzoate, β-naphthoate, adipate or 1,1-methylene-bis-(2-hydroxy-3-naphthoate) salt thereof.

3,864,391

2,5-DIPHENYLCYCLOALIPHATIC ALKYLAMINES

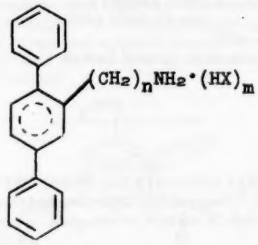
Gilbert H. Berezin, West Chester, Pa., and Joel G. Whitney, Kenneth Square, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 2, 1972, Ser. No. 293,814

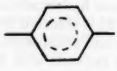
Int. Cl. C07c *87/28*

U.S. Cl. 260—570.5 CA **3 Claims**

1. A compound of the formula



wherein



is selected from the group consisting of cyclohexylene, cyclohexenylene, cyclohexadienylene and phenylene; *n* is 1 or 2; *m* is 0, ½ or 1; and X is halogen, sulfate or bisulfate.

3,864,392

OLIGOMERS OF HYDROLYZED ACRYLAMIDE-SULFUR DIOXIDE COPOLYMERS

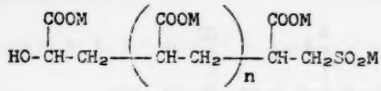
Hans Peter Panzer, Stamford; William Charles Firth, Jr., Wilton; Anthony Thomas Coscia, South Norwalk, and Lucille Elma Palmer, Darien, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 134,057, April 14, 1971, Pat. No. 3,792,027. This application Sept. 11, 1973, Ser. No. 396,167

Int. Cl. C07c *145/00*

U.S. Cl. 260—513.7 **3 Claims**

1. An oligomer having the formula



wherein n is a whole, positive integer of 1–9, inclusive, and M is an alkali metal or alkaline earth metal.

3,864,393

PROCESS FOR THE PRODUCTION OF OXALIC ACID

Hermann Rohl, and Wilhelm Knepper, both of Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

Filed Jan. 7, 1974, Ser. No. 431,373

Claims priority, application Germany, Jan. 11, 1973, 2301197

Int. Cl. C07c *51/24*

U.S. Cl. 260—538 **10 Claims**

1. In a process for the production of oxalic acid by the oxidation of ethylene oxide wherein a stream of gaseous ethylene oxide is introduced into aqueous nitric acid in the presence of gaseous oxygen, the improvement which comprises introducing a mixture of nitrogen oxides and gaseous oxygen into the nitric acid concurrently with the introduction of the ethylene oxide and maintaining the nitric acid at a temperature of 30°–70° C. and at a concentration of 50–70 percent by weight of HNO_3.

3,864,394

PROCESS FOR PREPARING PHENYLPHOSPHONOUS DICHLORIDE

Francis A. Via, Yorktown, N.Y.; Eugene H. Uhing, Ridgewood, N.J., and Arthur D. F. Toy, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 19, 1973, Ser. No. 417,172

Int. Cl. C07f *9/52*

U.S. Cl. 260—543 P **12 Claims**

1. In a method for preparing phenylphosphonous dichloride by the reaction of monochlorobenzene, phosphorus trichloride and elemental phosphorus substantially all in the yellow or white form in an autoclave, the improvement which comprises reacting said reactants at a temperature (T) within the range of from about 275°C. to about 400°C. for a period of time (t) of from about one-fourth hour to about 30 hours using a concentration of phosphorus trichloride, phosphorus, and chlorobenzene in amounts sufficient to provide a molar ratio (C) of

$$(PCl_3)/(\bigcirc\text{-}Cl)$$

within the range of from about 0.6 and about 3, and a molar ratio (Z) of elemental phosphorus to said chlorobenzene within the range of from about 0.5 to about 2.0, said temperature, time and molar ratios being selected in such a manner sufficient to satisfy the requirements of the formula:

$$Y = \frac{(A)\quad (t)}{A/R + t + (B_3)(R)(t^2)} + B_8$$

$$1000$$

wherein Y equals % yield based on the amount of charged chlorobenzene and phosphorus relative to the ratio of

$$6(\bigcirc\text{-}Cl)P_a$$

t equals time in hours
A equals $(E)(C)/[(E/100B_7) + C]$
R equals $(Z)[10^{(B_4 + B_5(T-300))}]$
E equals $B_4 + B_5(T-300) + B_6(Rec)$
T equals temperature in degrees centigrade
C equals

$$(PCl_3)/(\bigcirc\text{-}Cl)$$

molar ratio
Rec equals

$$(\bigcirc)_2PCl/\bigcirc\text{-}Cl$$

molar ratio
Z equals

$$(P)/(\bigcirc\text{-}Cl)$$

molar ratio
B_1 equals 1.9556
B_2 equals 0.0327
B_3 equals 0.00674
B_4 equals 215.26
B_5 equals − 0.508
B_6 equals 147.39
B_7 equals 15.23
B_8 equals − 87.46

wherein the time, temperature and molar ratios are selected to provide a yield of at least 60% or higher, said formula having a confidence limit of ± 18.0% on the percent yield with the proviso that the yield be at least 60%.

3,864,395

PHENYL UREAS, THEIR USE AS SELECTIVE HERBICIDES

Henry Martin, Basel; Otto Rohr, Therwil; Dieter Duerr, Bottmingen; Stefan Janiak, Basel, all of Switzerland; Georg Pissiotas, Loerrach, Germany, and Werner Toepfl, Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 816,375, April 15, 1969, abandoned. This application Oct. 8, 1971, Ser. No. 187,831

Int. Cl. C07c *127/18*

U.S. Cl. 260—553 A **2 Claims**

1. N-(3-chloro-4-methoxymethoxyphenyl)-N′,N′-dimethyl urea.

3,864,396

ACYLATED PERFLUOROALKANESULPHONAMIDES

Adolf Staffe, Oplanden, and Klaus Gerlach, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

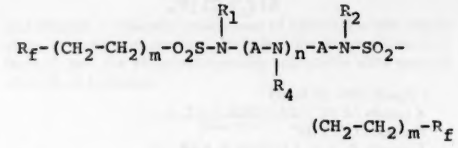
Filed Dec. 8, 1972, Ser. No. 313,276

Claims priority, application Germany, Dec. 10, 1971, 2161341

Int. Cl. C07c *143/74*

U.S. Cl. 260—556 F **7 Claims**

1. Perfluoroalkanesulphonamide of the formula



in which

R_1 and R_2 independently of one another are hydrogen; C_1–C_4-alkyl; or C_1–C_4-alkyl substituted by nitrile or lower alkoxy;

A is C_2–C_{10}-alkylene or C_2–C_{10}-alkylene interrupted by oxygen;

n is a number from 1 to 3;

R_f is perfluorinated butyl;

m is 1 or 0; and

R_4 is hydrogen; benzoyl; acetyl; propionyl; butyryl; acrylyl, methacryl; carbonamide; or carbonamide substituted with C_1–C_6-alkyl, cyclohexyl, methoxymethyl, phenyl or tolyl.

3,864,397

2,6-DIHALOBENZALDEHYDE SULFONYL HYDRAZONES

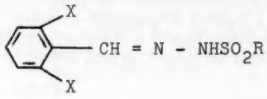
Tomas L. Fridinger; Edward L. Mutsch, both of Woodbury Twsp., Washington City, and David R. Pauly, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 90,074, Nov. 16, 1970, Pat. No. 3,709,936. This application Oct. 16, 1972, Ser. No. 297,970

Int. Cl. C07c *143/74, 143/78*

U.S. Cl. 260—556 H **7 Claims**

1. A compound having the formula



wherein X is halogen and R can be alkyl and haloalkyl having from 1 to 4 carbon atoms, phenyl and substituted phenyl wherein the phenyl substituents are selected from the group consisting of halogen, nitro and alkoxy, alkyl and haloalkyl having from 1 to 4 carbon atoms.

3,864,398

PROCESS FOR THE PREPARATION OF ACYLAMINO ALKANOL DERIVATIVES

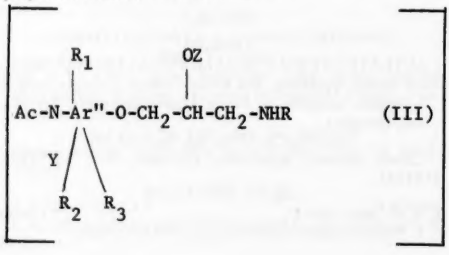
Yasushi Suzuki, Yokohama, and Kunio Tsukamoto, Zushi, both of Japan, assignors to Teikoku Hormone Mfg. Co., Ltd., Minato-ku, Tokyo, Japan

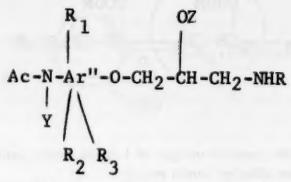
Filed May 1, 1972, Ser. No. 249,196

Int. Cl. C07c *103/38*

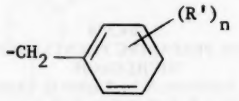
U.S. Cl. 260—562 A **11 Claims**

1. A process for the preparation of a 1-aryloxy-3-amino-propanol derivative of the formula

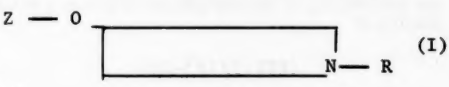




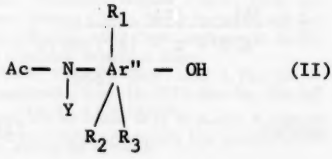
wherein R represents a straight or branched chain alkyl group having up to 12 carbon atoms or an aralkyl group having 7 to 9 carbon atoms; Ar'' represents a benzene or naphthalene ring; R_1, R_2 and R_3 represent, independently, a hydrogen atom, an alkyl or alkenyl group haing 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a hydroxyl group or an amino group, or R_1 and R_2 may be bonded together to form an alkylene or ketoalkylene group or to form a 5- or 6-membered heterocyclic ring with a hereto atom; Ac represents an organic acid residue selected from the group consisting of organic carboxylic acid residue, organic sulfonyl groups, organic sulfinyl groups, organic sulfenyl groups, organic phosphonyl groups and triphenylmethyl groups; Y represents hydrogen atom, an alkyl group having up to 3 carbon atoms or the group Ac, or Y may be bonded to the group Ac to form an ethylenedicarbonyl, maleyl, phthalyl or naphthalyl group; and Z is a hydrogen atom, an alkoxyalkyl group, a benzyloxymethyl group or a group of the formula



wherein R′ is a hydrogen atom or an electron donor group selected from the group consisting of an alkoxy group having up to 3 carbon atoms, an alkyl group having up to 3 carbon atoms, a halogen atom, a halogenated alkyl group having up to 3 carbon atoms, amino group and nitro group; and n is an integer of 1 to 3; which comprises reacting a compound of the formula



wherein Z and R as as defined above, with a compound of the formula



wherein R_1, R_2, R_3, Ar'', Ac and Y are as defined above.

3,864,399

CATALYTIC REDUCTION OF NITROPARAFFINS TO OXIMES AND CATALYST THEREFOR

John W. McDowell, Odessa, Tex., and Leon O. Winstrom, East Aurora, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 863,357, Oct. 2, 1969, abandoned. This application Jan. 29, 1973, Ser. No. 327,554
Int. Cl. C07c *131/04*
U.S. Cl. 260—566 A 11 Claims

1. A process for the production of an oxime which comprises contacting a nitroparaffin selected from the group consisting of primary and secondary nitroparaffins containing at least two carbon atoms and nitrocyclohexane with hydrogen in the presence of a catalyst which comprises about 55 to 75 weight percent copper, about 20 to 40 weight percent zinc, and about 0.1 to 10 weight percent silver at a pressure less than about 300 p.s.i.g. and a reaction temperature within the range of about 20°C. to the degradation temperature of said oxime.

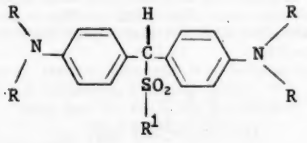
3,864,400

PRODUCTION OF ARYL-(4,4'-BIS-(DIALKYLAMINO)-BENZHYDRYL)-SULFONES

Walter Seibert, 46 Leuschnerstrasse, 6700 Ludwigshafen, Germany

Filed Feb. 20, 1973, Ser. No. 333,644
Int. Cl. C07c *85/00*
U.S. Cl. 260—570 D 2 Claims

1. A process for the production of a 4,4'-bis-(dialkylamino)-benzhydrylsulfone of the formula (I):

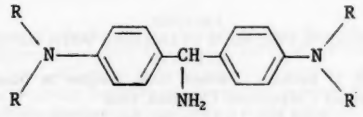


(I)

in which:

R is methyl or ethyl; and

R^1 phenyl or phenyl substituted by methyl, chloro or nitro ps wherein a compound of the formula (II):



(II)

is condensed in acid solution at a pH of less than 6 with a compound of the formula (III):

$$R^1—SO_2H \quad \text{(III)}.$$

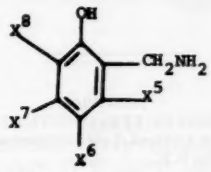
3,864,401

SUBSTITUTED 2-AMINOMETHYL-4,6-DIHALOPHENOLS

Everett M. Schultz, Ambler, and Edward J. Cragoe, Jr., Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 23, 1970, Ser. No. 101,195
Int. Cl. C07c *87/28*
U.S. Cl. 260—570.9 4 Claims

1. A compound of the formula:



wherein:

X^5 is methyl, ethyl or methoxy;

X^7 is methyl, ethyl or methoxy; and

X^6 and X^8 are chloro, bromo, iodo or fluoro and the non-toxic pharmaceutically acceptable salts thereof.

3,864,402

PURIFICATION OF SECONDARY ALKYL AMINES

Ronald W. Swanson, Croton-on-Hudson; Edwin R. Kerr, and William Smolin, both of Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed May 7, 1973, Ser. No. 358,236
Int. Cl. C07c *85/16*
U.S. Cl. 260—583 N 14 Claims

1. A process for separating secondary alkyl primary amines containing 8 to 40 carbon atoms from mixtures containing from about 5 to 30 percent by weight of said amines from their contaminants, including inert non-polar paraffinic contaminants by treatment of said amines contained in the mixture with carbon dioxide to form secondary alkyl primary amine-carbon dioxide complexes, and extracting said complexes into inert polar solvent selected from the group consisting of alkanols containing 1 to 4 carbon atoms, mixtures of alkanols containing 1 to 4 carbon atoms and mixtures of alkanols containing 1 to 4 carbon atoms with water, said process consisting essentially of:

a. admixing said mixture of secondary alkyl primary amines and said contaminants at about 15° to 100°C under pressures of carbon dioxide, ranging from about 0 psig to 500 psig, in an amount and for a time sufficient to form substantial amounts of said amine-carbon dioxide complexes, in the presence of said inert polar solvent to form two phases, an inert polar solvent phase which contains substantially all of said amine-carbon dioxide complexes, and a paraffinic phase which contains substantially all of said contaminants,

b. separating said two phases from each other and springing said secondary alkyl primary amine from said amine-carbon dioxide complexes in said inert polar solvent phase.

3,864,403

PREPARATION OF 6-METHYL-5-HEPTEN-2-ONE

George Ember, Hackensack, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 10, 1973, Ser. No. 387,554
Int. Cl. C07c *49/04*
U.S. Cl. 260—593 R 9 Claims

1. A process for obtaining 6-methyl-5-hepten-2-one, comprising heating a reaction mixture, containing:

a. 2,2,6-trimethyl-3,4-dihydropyran, 6-methyl-6-hepten-2-one or a mixture thereof, and

b. 0.001 to 0.5 weight percent of a strong acid selected from the group consisting of lower alkyl sulfonic acids, trifluoromethanesulfonic acid, camphorsulfonic acid, naphthalene-1-sulfonic acid, naphthalene-2-sulfonic acid, benzenesulfonic acid, p-nitrophenylsulfonic acid, 4-chlorobenzenesulfonic acid and p-toluene sulfonic acid and mixtures thereof to a temperature of 100°C. to 300°C. at a pressure at or above the vapor pressure of the reaction mixture.

3,864,404

SYNTHESIS OF ETHYL VINYL KETONE

James D. McClure, Oakland, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Nov. 6, 1969, Ser. No. 874,676
Int. Cl. C07c *45/08*
U.S. Cl. 260—597 R **6 Claims**

1. The process of producing predominantly ethyl vinyl ketone by reacting ethylene and carbon monoxide in the presence of water at a temperature of from about 150° to about 210°C. and at a pressure of 1,000 to 4,500 psig and an ethylene to carbon monoxide molar ratio of from 5 to 1 to about 12 to 1 in an inert liquid phase reaction solvent selected from the group consisting of hydrocarbons, alkyl ethers, aromatic ethers, alkyl esters, cyclic olefinic oxides aliphatic ketones and aromatic ketones, each containing from 4 to 15 carbon atoms in the presence of a cuprous alkanone carbonyl complex as catalyst, wherein the water is present in a ratio of 1.0 to about 5 moles of water per mole of said cuprous catalyst wherein the amount of cuprous metal catalyst present in the amount of from 0.01% mole to about 10% mole based on the amount of carbon monoxide present.

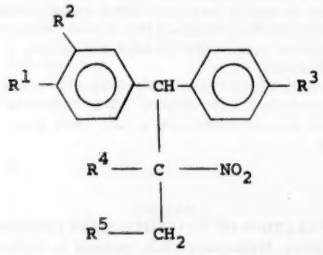
3,864,405

1,1-BIS-(PHENYL)-2-NITROPROPANES

George Holan, Brighton, Victoria, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Division of Ser. No. 174,265, Aug. 23, 1971, Pat. No. 3,823,192. This application Dec. 20, 1973, Ser. No. 426,592
Claims priority, application Australia, Aug. 31, 1970, 2367/70; Feb. 5, 1971, 3947/71; Feb. 12, 1971, 4010/71
Int. Cl. C07c *149/32*
U.S. Cl. 260—609 F **3 Claims**

1. A compound of the formula:



wherein R' is a methylthio, ethylthio or propylthio group; R^2 is hydrogen; R^3 is a methoxy, ethoxy, propoxy, methylthio, ethylthio or propylthio group; and one of the groups R^4 and R^5 is hydrogen and the other of said groups is hydrogen or a methyl group.

3,864,406

PROCESS FOR THE PRODUCTION OF MANNITOL AND SORBITOL

Asko J. Melaja, and Lauri Hamalainen, both of Kantvik, Finland, assignors to Suomen Sokeri Osakeyhtio (Finnish Sugar Company), Helsinki, Finland

Filed Apr. 25, 1973, Ser. No. 354,392
Int. Cl. C07c *29/24, 31/26*
U.S. Cl. 260—637 R **7 Claims**

1. The method of separating mannitol and sorbitol from solutions consisting essentially of both polyols and water which comprises

a. providing a column of alkaline earth metal salt of a polystyrene sulfonate cation exchanger, cross coupled with di-vinyl benzene;

b. submerging the column of resin in water;

c. feeding a solution consisting essentially of water, mannitol and sorbitol, in uniform supply to the resin surface in the column at a flow rate of 0.2 to 1.5 cubic meters per hour per square meter of the cross-section of the resin column followed by elution of the column with water; and

d. recovering successively from the downstream side of the resin bed

1. a first fraction rich in mannitol, and

2. a second fraction rich in sorbitol.

3,864,407

CATALYTIC PROCESS FOR PRODUCING HIGHER MOLECULAR WEIGHT

James E. Yates, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed June 6, 1973, Ser. No. 367,687
Int. Cl. C07c *29/00, 31/02*
U.S. Cl. 260—642 C **10 Claims**

1. A process for producing higher molecular weight hydrocarbon alcohols by condensing at least one lower molecular weight alkanol having a methylene group adjacent to the hydroxylated carbon atom; said process being carried out in liquid phase at about 80° to about 300°C in the presence of an alkali catalyst and a catalytic amount of an organic silver compound while simultaneously removing water as it forms; said alkali catalyst being an alkali metal, alkali metal hydroxide, alkali metal oxide, alkali metal bisulfite or alkali metal hydrocarbon alcoholate; and said organic silver compound being defined by

$$(R'-C(=O)-C(H)=C(R')-O)\ Ag, \text{ or}$$

$$(R''-SO_3)\ Ag$$

wherein R' and R'' are each, independently, a saturated or unsaturated, cyclic or acyclic, branch or straight chain hydrocarbon group.

3,864,408

METHYLENE CHLORIDE STABILIZED WITH METHYL ACETATE

Norman L. Beckers, Chardon, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 23, 1973, Ser. No. 335,364
Int. Cl. C07c *17/40, 17/42*
U.S. Cl. 260—652.5 R **2 Claims**

1. A stabilized methylene chloride composition consisting essentially of methylene chloride and stabilizing amounts of from about 0.05 to about 2.0 percent by weight of the methylene chloride of each of methyl acetate and propylene oxide.

3,864,409

METHOD FOR VINYL HALIDES

Bill J. Pope, c/o Department of Chemical Engineering, Brigham Young University, Provo, Utah 84601

Filed Nov. 30, 1970, Ser. No. 93,742
Int. Cl. C07c 21/02
U.S. Cl. 260—656 R 6 Claims

1. A method for the preparation of vinyl halides which comprises thermally or catalytically cracking methane, ethane, propane, butane, naphtha, or natural gas at a temperature above 500°C. and for a time sufficient to produce acetylene precursor free radicals and quenching the cracked product with a halogen or hydrogen halide to a temperature below 400°C.

3,864,410

PROCESS FOR HALOGENATING PARAFFINS

Charles M. Selwitz, Monroeville, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 22,711, March 25, 1970, Pat. No. 3,689,577. This application May 22, 1972, Ser. No. 255,645The portion of the term of this patent subsequent to Sept. 5, 1989, has been disclaimed.
Int. Cl. C07c 17/10
U.S. Cl. 260—659 R 8 Claims

1. A process for preparing a halogenated paraffin selected from the group consisting of chloro paraffins and bromo paraffins which comprises heating at a temperature of about 50° to about 150° C. a paraffin having from 41 to about 400,000 carbon atoms with a halogen ion selected from the group consisting of chloride ions and bromide ions, said chloride ions and bromide ions being obtained from hydrogen chloride and hydrogen bromide, respectively, nitrate ions, sulfuric acid and water, wherein the amount of halogen ion relative to the paraffin on a weight basis is from about 20:1 to about 1:10, the amount of nitrate ion relative to the paraffin on a weight basis is from about 2:1 to about 1:500, the amount of sulfuric acid relative to the paraffin on a weight basis is from about 50:1 to about 1:5 and the amount of water relative to the paraffin on a weight basis is from about 50:1 to about 1:2.

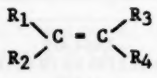
3,864,411

SELECTIVE CHLORINATION OF OLEFINS IN FUSED SALTS

Wolfgang H. Mueller, Elizabeth, N.J., assignor to Esso Research and Engineering Company, Linden, N.J.

Filed Jan. 27, 1967, Ser. No. 612,078
Int. Cl. C07c 17/02
U.S. Cl. 260—660 5 Claims

1. A halogenation process which comprises reacting a mono-olefinic hydrocarbon selected from the group consisting of (a) C_2–C_{20} compounds of the general formula:



wherein R_1, R_2, R_3 and R_4 are each selected from the group consisting of hydrogen, C_1–C_{14} alkyl and C_6–C_{10} aryl radicals, and (b) C_3–C_{18} cyclic hydrocarbons with a halogen selected from the group consisting of chlorine and bromine, the reaction being conducted in a liquefied halide salt melt bath at temperatures ranging from about 100° to 400°C., wherein the liquefied halide salt melt bath is comprised of an aluminum halide and not less than a total of one molar equivalent, based on aluminum halide, of at least one halide selected from the group consisting of alkali metal halides, ammonium halides, and mixtures thereof.

3,864,412

REMOVAL OF CARBONYL COMPOUNDS FROM 4-VINYLCYCLOHEXENE

Donald E. Murphy, University Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 31, 1973, Ser. No. 365,512
Int. Cl. C01c 13/20
U.S. Cl. 260—666 A 4 Claims

1. A process for removing carbonyl compounds from 4-vinylcyclohexene to less than 50 ppm wherein 4-vinycyclohexene is contacted with attapulgite clay.

3,864,413

STABILIZED METAL CHLOROFORM

Norman L. Beckers, 11799 Joyacre Ln., Chardon, Ohio 44024, and Edward A. Rowe, 7129 Andover, Mentor, Ohio 44060

Continuation-in-part of Ser. No. 5,101, Jan. 22, 1970, abandoned. This application Apr. 11, 1972, Ser. No. 243,072
Int. Cl. C07c 17/40, 17/42
U.S. Cl. 260—652.5 R 1 Claim

1. A composition of matter which consists essentially of methyl chloroform stabilized with a mixture of

a. 0.1 to 2.0 percent by eight of a nitroalkane of from 1 to 3 carbon atoms,
b. 0.05 to 0.5 percent by weight of an aliphatic epoxide selected from the group consisting of propylene oxide, butylene oxide, epichlorohydrin, and methyl glycidyl ether,
c. 0.1 to 1.0 percent by weight of trioxane,
d. 0.1 to 2.0 percent by weight of propylene glycol monomethyl ether,
e. 0.1 to 2.0 percent by weight of t-amyl alcohol,
f. 0.1 to 2.0 percent by weight of heptane, and
g. 0.001 to 0.10 percent by weight of N-methyl morpholine.

3,864,414

METHOD FOR PURIFICATION OF TECHNICAL HEXACHLORBUTADIENE FROM CHLORORGANIC ADMIXTURES

Vadim Dmitrievich Simonov, Kolsevaya ulitsa, 49, kv. 20; Anatoly Vasilievich Ivanov, ulitsa Kosmonavtov, 18, kv. 22, both of UFA; Lev Markovich Kogan, Kutuzovsky prospekt, 9, kv. 90, Moscow; Markus Vladimirovich Ljubarsky, prospekt Oktyabrya, 105/3, kv. 49, UFA; Gennady Timofeevich Dremin, Pekinskaya ulitsa, 20, kv. 14, UFA; Boris Ivanovich Voronenko, Rossiiskaya ulitsa, 5, kv. 33, UFA, and Svetlana Fedorovna Burova, ulitsa Ostuzheva, 13, kv. 29, Voronezh, all of U.S.S.R.

Filed Feb. 3, 1972, Ser. No. 223,290
Int. Cl. C07c 21/20
U.S. Cl. 260—655 6 Claims

1. A method for purification of technical hexachlorobutadiene containing chloroorganic admixtures including perchloroethylene, hexachloroethane, hexachloracyclopentadiene and polychlorobutanes comprising reacting said technical hexachlorobuadiene with chlorosulfonic acid at a molar ratio of 1:1–4 and at a temperature of 100°–150°C; cooling the reaction mixture to a temperature not above 80°C with formation of a layer of purified hexachlorobutadiene and a layer containing chlorosulfonic acid and oxidized chloroorganic admixtures; separating the layer of purified hexachlorobutadiene and neutralizing, washing with water and drying the separated layer of purified hexachlorobutadiene.

3,864,415

NOVEL COMPOUNDS AND METHOD

Joseph G. Atkinson, Montreal, and Michael O. Luke, Beloeil, Quebec, both of Canada, assignors to Charles E. Frosst & Co., Kirkland, Quebec, Canada

Division of Ser. No. 66,657, Aug. 24, 1970, Pat. No. 3,748,634, which is a continuation-in-part of Ser. No. 724,429, April 26, 1968, abandoned. This application Dec. 4, 1972, Ser. No. 311,601

Claims priority, application Canada, Apr. 29, 1967, 989262

Int. Cl. C07c *1/00*

U.S. Cl. 260—666 P **9 Claims**

1. Deuterated saturated cyclic and acyclic hydrocarbons having from 10 to 36 carbon atoms, having an isotopic purity of at least 95 atom % D, selected from the group consisting of n-decane-d_{22}, n-dodecane-d_{26}, n-hexadecane-d_{34}, n-octadecane-d_{38}, n-tetracosane-d_{50}, n-hexatriacontane-d_{74}, 2,2,4,4,6,8,8-heptamethylnonane-d_{34}, 2,6,10,14-tetramethylpentadecane-d_{40}, Decalin-d_{18}, cyclododecane-d_{24}, 1,2-dicyclohexylethane-d_{26}, squaline-d_{62}, pristane-d_{40}, n-octacosane-d_{58}, n-petadecane-d_{32}, and 2,6,11,15-tetramethylhexadecane-d_{42}.

3,864,416

SEPARATION OF TETRA-ALKYL SUBSTITUTED AROMATIC HYDROCARBON ISOMERS

Douglas R. Campbell, Brookfield, and James W. Priegnitz, Elgin, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 18, 1974, Ser. No. 452,481

Int. Cl. C07c *7/12*

U.S. Cl. 260—674 A **20 Claims**

1. A process for separating tetra-alkyl substituted monocyclic aromatic hydrocarbon isomers, the alkyl constituents containing from 1 to 4 carbon atoms each, from a feed mixture comprising at least two of said isomers which process comprises contacting said feed with a crystalline aluminosilicate selected from the group consisting of type X structured and type Y structured zeolites containing at exchangeable cationic sites at least one cation selected from the group consisting of cations of Group I-A metals thereby selectively adsorbing at adsorption conditions one or more of said isomers.

3,864,417

SATURATED HYDROCARBON DISPROPORTIONATION AT LOW TEMPERATURES

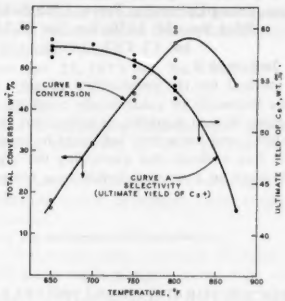
Thomas R. Hughes, Orinda, Calif., assignor to Chevron Reseach Company, San Francisco, Calif.

Continuation of Ser. No. 3,303, Jan. 16, 1970,. This application Aug. 1, 1973, Ser. No. 384,853The portion of the term of this patent subsequent to Nov. 27, 1990, has been disclaimed.

Int. Cl. C07c *9/00, 3/00*

U.S. Cl. 260—676 R **5 Claims**

1. In a process for disproportionation of saturated hydrocarbons which comprises contacting the saturated hydrocarbons in a disproportionation reaction zone, with a catalytic mass having a component with catalytic activity for alkane dehydrogenation and a second component with catalytic-activity for olefin disporportionation, the improvement which comprises carrying out said contacting at a temperature between 400°F and 850°F, and at an elevated pressure of at least 100 psig, and in the presence of no more than 5 weight percent olefins, and withdrawing from the disproportionation reaction



zone product saturated hydrocarbons containing no more than 5 weight percent olefins.

3,864,418

PROCESS OF SEPARATING COMPLEXABLE MATERIALS EMPLOYING SEMIPERMEABLE POLYMER FILM

Robert D. Hughes, and Edward F. Steigelmann, both of Park Forest, Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Mar. 12, 1973, Ser. No. 339,975

Int. Cl. C07c *11/00*

U.S. Cl. 260—677 A **16 Claims**

1. In a method for separating a material from a mixture which comprises contacting said mixture containing said material with a first side of an essentially solid, water-insoluble, hydrophilic, semi-permeable membrane having therein an aqueous liquid barrier having metal ions which combine with said material to form a water-soluble complex, the partial pressure of said material on a second side of said semi-permeable membrane being sufficiently less than the partial pressure of said material in said mixture to provide separated material on said second side of said semi-permeable membrane, said separated material having a transfer rate across said liquid barrier that is greater than at least one other component of said mixture, and removing said separated material from the vicinity of said second side of said semi-permeable membrane, the improvement which comprises employing as said semi-permeable membrane a semi-permeable polymer film having therein an aqueous liquid barrier having in solution said complex-forming metal ions which combine with said material to form a water-soluble complex, said polymer film having an increased permeability to said material resulting from forming the semi-permeable polymer film from a solution having dissolved therein film-forming material and an amount of pore-forming material sufficient to increase the permeability of the film when removed from the film and removing the pore-forming material from the film.

3,864,419

TERTIARY MONO OLEFIN EXTRACTION WITH MIXED ACIDS

Donald E. Murphy, University Heights, Ohio, assignor to The B. F. Goodrich Co., Akron, Ohio

Filed Oct. 30, 1973, Ser. No. 411,049

Int. Cl. C07c *11/00*

U.S. Cl. 260—677 S **3 Claims**

1. A process for extracting tertiary mono olefins from a liquid refinery C_4 to C_6 hydrocarbon stream wherein said stream is contacted with a mixture containing (A) from about 44% to about 71% by weight sulfuric acid, (B) from about 1% to about 50% by weight of at least one aliphatic monocarboxylic acid containing from 2 to 6 carbon atoms, and (C) water

in a molar ratio of water to olefin of at least 1.5/1, said water making up the difference between total acid percentage and 100% of said mixture, the weight ratio of said mixture to said hydrocarbon stream is at least 0.7/1, and mixture is contacted with said hydrocarbon stream at a temperature in the range from about −10°C to about 50°C.

3,864,420

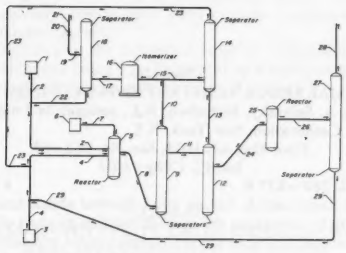
ALPHA OLEFIN SEPARATION PROCESS

Robert A. Dombro, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 2, 1974, Ser. No. 466,387

Int. Cl. C07c *11/02*

U.S. Cl. 260—677 A **11 Claims**



1. A process for the separation of alpha olefins from a feedstock comprising alpha and internal olefins at a temperature of from about 50°C to about 150°C and a pressure of from about 1 atmosphere to about 100 atmospheres which comprises:

a. contacting said feedstock with a thiophenolic compound in the presence of a catalyst comprising an organic peroxide material selected from the group consisting of di-t-butyl peroxide, t-butyl perbenzoate and benzoyl peroxide to produce secondary and normal saturated sulfides;

b. separating said secondary saturated sulfides from said normal saturated sulfides;

c. contacting the normal saturated sulfides with a catalyst comprising a material selected from the group consisting of alumina, activated alumina, silica magnesia, thallia and zirconia compound to produce a thiophenolic compound and the desired alpha olefins;

d. separating said thiophenolic compounds from said alpha olefins and recovering the resultant alpha olefins.

3,864,421

HYDROALKYLATION OF AROMATIC HYDROCARBONS

Robert M. Suggitt, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed May 7, 1973, Ser. No. 358,217

Int. Cl. C07c *15/12*

U.S. Cl. 260—668 R **18 Claims**

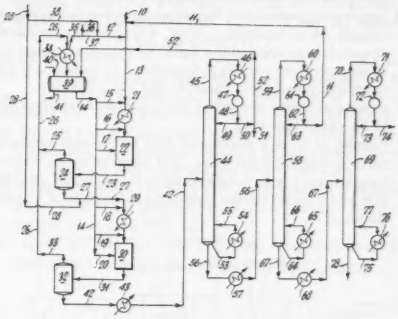
1. The process for hydroalkylating a charge mononuclear hydrocarbon with a hydroalkylating quantity of hydrogen which comprises

passing said charge hydrocarbon, said hydroalkylating quantity of hydrogen, and an inert diluent in liquid phase, through a hydroalkylation operation at hydroalkylating conditions in the presence of hydroalkylation catalyst thereby exothermically hydroalkylating said charge hydrocarbon and forming a product stream containing hydroalkylate;

withdrawing said product stream containing said hydroalkylate from said hydroalkylation operation;

passing said withdrawn product stream to a separation operation;

forming in said separation operation (i) a vapor containing said volatilized inert diluent and (ii) a cooled product stream;



withdrawing from said separation operation (i) said vapor containing said volatilized inert diluent and (ii) said cooled product stream; and

recovering said product stream containing hydroalkylate.

3,864,422

CYCLOPENTADIENE REMOVAL FROM ISOPRENE PROCESS STREAMS

Richard W. Hein, Hudson, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Sept. 26, 1973, Ser. No. 400,728

Int. Cl. C07c *7/04*

U.S. Cl. 260—681.5 R **3 Claims**

1. A process for the removal of cyclopentadiene from isoprene comprising (A) contacting isoprene containing from about 0.1% to about 2% by weight cyclopentadiene with a compound selected from the group consisting of benzoquinone and naphthoquinone to form a high boiling adduct and (B) removing said adduct from said isoprene by fractionation, thereby reducing cyclopentadiene level in said isoprene to less than 1 ppm, wherein said isoprene contains from 0% water up to about saturation with water and beyond to about 1% free water, benzoquinone or naphthoquinone is in a molar ratio to cyclopentadiene of from about 0.5/1 to about 4/1, and said contacting occurs at a temperature from about 10°C. to about 95°C.

3,864,423

ALKYLATION OF HYDROCARBONS

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 21, 1972, Ser. No. 282,230

Int. Cl. C07c *3/54*

U.S. Cl. 260—683.51 **5 Claims**

1. A process for the alkylation of hydrocarbons in the presence of hydrogen fluoride catalyst and a catalyst activator selected from the group consisting of primary alkyl fluorides having from 1 to 8 carbon atoms wherein said catalyst activator is present in an amount ranging from about 5 to about 30 weight percent, based on weight of catalyst and catalyst activator, comprising:

a. contacting in an alkylation reaction zone under alkylation conditions at least one paraffinic hydrocarbon and at least one olefinic hydrocarbon with said catalyst and said catalyst activator to obtain a reaction product comprising alkylate, propane, alkyl fluoride, unreacted hydrocarbons and hydrogen fluoride;

b. passing said reaction product to a phase separation zone and separating therefrom a hydrocarbon phase compris-

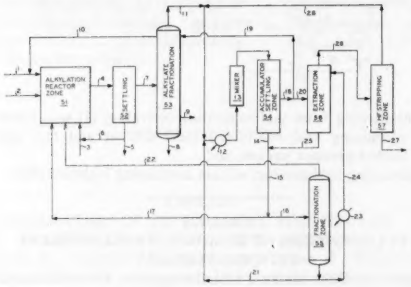
ing alkylate, propane, alkyl fluoride, unreacted hydrocarbons and a minor amount of hydrogen fluoride;

c. passing said hydrocarbon phase to a first fractionation zone and withdrawing therefrom a liquid stream comprising alkylate product and a vapor stream comprising propane, alkyl fluoride and hydrogen fluoride;

d. condensing said vapor stream and passing said condensed stream to a separation zone wherein said condensed stream is separated into a liquid hydrocarbon phase comprising propane and alkyl fluoride and a liquid acid phase comprising hydrogen fluoride and alkyl fluoride;

e. passing at least a portion of said liquid hydrocarbon phase to an extraction zone;

f. passing at least a portion of said liquid acid phase to a second fractionation zone and separating therefrom a light stream comprising hydrogen fluoride and alkyl fluoride and a liquid stream consisting essentially of hydrogen fluoride;



g. combining a first portion of said liquid stream from step (f) with said vapor stream from step (c) prior to condensing said vapor stream in step (d);

h. passing a second portion of said liquid stream from step (f) to said extraction zone;

i. extraction in countercurrent fashion in said extraction zone said liquid hydrocarbon phase from step (d) with the liquid hydrogen fluoride from step (f) thereby separating said propane from said alkyl fluoride;

j. withdrawing from said extraction zone a raffinate comprising propane and hydrogen fluoride;

k. separately recovering from said raffinate a hydrocarbon stream consisting essentially of propane;

l. recovering from said raffinate an overhead stream comprising propane and hydrogen fluoride; and

m. combining said overhead stream with said vapor from step (c) prior to condensing said vapor in step (d).

3,864,424

ISOMERIZATION PROCESS

John F. Brennan, and Herman S. Bloch, both of Des Plaines, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 30, 1973, Ser. No. 356,008

Int. Cl. C07c *5/30*

U.S. Cl. 260—683.2 **7 Claims**

1. A process for the isomerization of a double bond located on the tertiary carbon atom of a branch-chained mono-olefin in which process the double bond is isomerized to a different situs involving the tertiary carbon atom without appreciable formation of disubstituted ethylenes or dimers, said process comprising treating said branch-chained mono-olefin at a temperature of from about 20° to about 80°C. with a catalyst consisting essentially of partially dehydrated weakly acidic gamma alumina containing less than 0.1% chloride, said alumina having been treated in an air stream at a temperature of about 550°C., and recovering the resultant isomerized product.

3,864,425

RUTHENIUM-PROMOTED FLUORIDED ALUMINA AS A SUPPORT FOR SbF_5-HF IN PARAFFIN ISOMERIZATION

Lloyd E. Gardner, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 17, 1973, Ser. No. 398,086

Int. Cl. C07c *5/28*

U.S. Cl. 260—683.68 **10 Claims**

1. A method of isomerizing paraffin hydrocarbons containing 4 to 8 carbon atoms contained in a feedstream which comprises passing said feedstream and hydrogen into contact with a composition comprising a ruthenium-promoted fluorided alumina catalyst comprising SbF_5-HF to isomerize said hydrocarbons and recovering the isomerized hydrocarbons.

3,864,426

THERMAL SHOCK RESISTANT EPOXY COMPOSITIONS

George A. Salensky, Metuchen, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 23, 1973, Ser. No. 363,188

Int. Cl. C08g *45/04*

U.S. Cl. 260—837 R **6 Claims**

1. A cured article having good thermal shock resistance, said article comprising the molded reaction product of a solid composition, fusible at elevated temperatures and suitable for use in molding, containing (a) a polyglycidyl ether of a polyhydric phenol, having an oxirane oxygen equivalency greater than one, (b) an epoxy curing agent and (c) an acrylic graft copolymer comprising an alkyl methacrylate polymer and an alkyl acrylate polymer, said alkyl methacrylates polymer having been polymerized in intimate contact with said alkyl acrylate polymer, wherein the acrylic graft copolymer contains from 40 to 75 weight percent of alkyl acrylate and from 60 to 25 weight percent of alkyl methacrylate, the percentage being based on weight of said acrylic graft copolymer.

3,864,427

MOLDING COMPOSITIONS

Ryuichi Nakane, Kobe, and Hisatsugu Minamida, Osaka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 26, 1972, Ser. No. 301,246

Claims priority, application Japan, Nov. 1, 1971, 46-86924; Oct. 7, 1972, 47-13412

Int. Cl. c08f *43/08*

U.S. Cl. 260—862 **21 Claims**

1. A molding composition comprising (1) an unsaturated polyester produced by reacting an α,β-unsaturated aliphatic dicarboxylic acid, or a mixture of the dicarboxylic acid and at least one of a saturated aliphatic dicarboxylic acid and an aromatic dicarboxylic acid, with a polyol, (2) a monomer polymerizable with the unsaturated polyester and having one vinyl group per molecule, and (3) a crystalline styrene polymer in which at least about 95 weight parts of the polymer is insoluble in methyl ethyl ketone at 40°c, and the insoluble portions of the polymere melt or soften at about 210° to about 230°C, or a copolymer of (a) styrene or a mixture of styrene and a monomer copolymerizable therewith and having one vinyl group per molecular and (b) a low molecular weight compound containing two non-conjugated ethylenically unsaturated double bonds per molecule.

3,864,428

POLYESTER/POLYCARBONATE/GRAFT COPOLYMER THERMOPLASTIC RESIN COMPOSITION

Yositugu Nakamura; Ryoichi Hasegawa, and Hiroaki Kubota, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 27, 1973, Ser. No. 392,002
Claims priority, application Japan, Aug. 30, 1972, 47-86283
Int. Cl. C08g *39/10*
U.S. Cl. 260—873 8 Claims

1. A thermoplastic resin composition consisting essentially of

A. 25 to 85 percent by weight of an aromatic polyester,

B. 10 to 75 percent by weight of an aromatic polycarbonate, and

C. 2 to 35 percent by weight of a graft copolymer of a butadiene polymer-vinyl monomer which is selected from the group consisting of methacrylic esters, aromatic monovinyl compounds, vinyl cyanide compounds, and mixtures thereof,

the proportion of the butadiene polymer component in the graft copolymer being 1 to 30 percent by weight based on the total weight of the components (A), (B) and (C).

3,864,429

BLEND OF POLYVINYL CHLORIDE RESINS WITH MERCAPTAN-MODIFIED MBS RESINS

Takashi Tanaka, and Shinichi Suzuki, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Feb. 12, 1973, Ser. No. 331,880
Claims priority, application Japan, Feb. 18, 1972, 47-017061
Int. Cl. C08f *15/00, 19/00*
U.S. Cl. 260—876 R 3 Claims

1. An impact-resistant vinyl chloride polymer resin composition having improved weather resistance which comprises a blend of (a) from 3 to 30 parts by weight of a modified MBS resin obtained from an addition-reaction of an alkyl mercaptan having 2 to 20 carbon atoms with a butadiene-styrene-methyl methacrylate graftpolymer resin, the amount of alkyl mercaptan being 1/100 to 1 mole per mole of conjugated diolefin in the MBS resin and (b) from 97 to 70 parts by weight of a vinyl chloride homopolymer or copolymer resin wherein said copolymer of vinyl chloride is a copolymer of a major quantity of vinyl chloride and a minor quantity of another monomer selected from the group consisting of vinylidene chloride, acrylic esters, methacrylic esters, fatty acid vinyl esters, acrylonitrile and mono-olefins.

3,864,430

RUBBER COMPOSITIONS CONTAINING CIS-POLYBUTADIENE AND 1,2-POLYBUTADIENE

Masashi Umeno, Kawasaki; Mitsuo Ichikawa, Hachioji; Yasumasa Takeuchi, Yokohama, and Eiichiro Shiratsuchi, Tokyo, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Nov. 20, 1972, Ser. No. 308,093
Int. Cl. C08d *9/04*; C08f *29/08*
U.S. Cl. 260—894 6 Claims

1. A rubber composition which consists essentially of a blend of 97 to 80 percent by weight of cis-polybutadiene and 3 to 20 percent by weight of 1,2-polybutadiene having a 1,2-addition units content of 70 percent or higher and crystallinity of 5 percent or higher.

3,864,431

STABILIZED POLYOLEFINS USEFUL AS WIRE INSULATION IN PETROLEUM-JELLY FILLED CABLES

Donald E. Reid, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 254,553, May 18, 1972, Pat. No. 3,798,286. This application Oct. 12, 1973, Ser. No. 406,070
Int. Cl. C08f *29/12*
U.S. Cl. 260—897 R 4 Claims

1. A polymer selected from the group consisting of high density polyethylene and crystalline polymers of propylene containing stabilizing amounts of the following additives:

A. from 0.1 to 1.5 parts per 100 parts of polymer (php) of a resonous condensation product of a terpene and phenol, having a molecular weight of at least 400,

B. from 0.1 to 1.0 php of a polymeric ester of a thiodialkanoic acid and a polyhydric alcohol, having a molecular weight of at least 500, and

C. from 0.02 to 0.5 php of oxalic acid bis(benzylidene hydrazide) or adipic acid bis(acetyl hydrazide).

3,864,432

PROCESS FOR THE PRODUCTION OF AN ELASTICIZED THERMOPLASTIC POLYMER MIXTURE IN A POURABLE POWDER FORM

Klaus Adler; Johann Bauer; Rupert Englbrecht; Werner Turba; Englbert Pichler, and Adolf Maluschka, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Nov. 22, 1972, Ser. No. 308,738
Claims priority, application Germany, Dec. 7, 1971, 2160743
Int. Cl. C08f *37/18*
U.S. Cl. 260—897 B 4 Claims

1. A process for the production of an elastomer treated thermoplastic polymer in a pourable powder form consisting essentially of adding a maximum of 50 parts of an aqueous elastomeric ethylene/vinyl acetate copolymer dispersion to 100 parts of a thermoplastic polymer powder in such an amount that not more than 25 parts by weight of water in said aqueous dispersion are present per 100 parts by weight of said thermoplastic polymer powder, mixing the two components under high sheer agitation at agitation speeds of from 1,000 to 3,000 RPM, at below the gelling temperature of said thermoplastic powder for a time sufficient to obtain a homogeneous distribution of the elastomeric resin on said thermoplastic powder and to obtain a substantially anhydrous powder, and recovering said elastomer treated thermoplastic polymer in a pourable powder form.

3,864,433

CURED RUBBER COMPOSITION COMPISING EPR OR EPDM AND A FLUORINE CONTAINING ETHYLENEPOLYMER

Yoshiharu Tatsukami, Niihama; Takashi Futami, Hirakata, and Yasuhiro Oda, Takatsuki, all of Japan, assignors to Sumitomo Chemical company Limited and Daikin Kogyo Co. Ltd., both of Osaka, Japan

Filed Apr. 22, 1974, Ser. No. 463,032
Claims priority, application Japan, Apr. 23, 1973, 48-46505
Int. Cl. C08f *29/22*
U.S. Cl. 260—897 C 16 Claims

1. A cured rubber composition prepared by curing, with an organic peroxide as a curing agent, a composition consisting essentially of (A) 95 to 5 parts by weight of an amorphous ethylene-propylene and rubber and (B) 5 to 95 parts by weight of a fluorine-containing ethylene polymer selected from the group consisting of ethylene-herafluoropropene copolymer and ethylene-hexafluoropropene-ethylenically unsaturated monomer terpolymer, said copolymer or terpolymer containing 10 to 50 mole% of hexafluoropropene.

3,864,434

GRAFT COPOLYMERS OF LACTONE POLYESTERS AND BLENDS WITH POLYVINYL CHLORIDE

Frank E. Critchfield, South Charleston, and Joseph V. Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 273,300, July 19, 1972, Pat. No. 3,816,566, which is a division of Ser. No. 109,982, Jan. 26, 1971, Pat. No. 3,760,034. This application Feb. 8, 1974, Ser. No. 440,799

Int. Cl. C08f 29/24

U.S. Cl. 260—899 4 Claims

1. Polyblend of polyvinyl chloride and about 10 to about 100 parts of graft copolymer, per hundred of polyvinyl chloride, said graft copolymer comprising:

a. lactone polyesters having a reduced viscosity of about 0.2 to 2.0 dl./gm., a molecular weight of about 5000 to 150,000 and repeating units having the general formula:

$$\{CHR_1(CH_2)_nC\text{-}O\}$$

wherein R_1 is H or an alkyl group containing 1 to about 6 carbon atoms, and n is an integer having a value of at least 3; and

b. graft copolymerized thereon about 1 to about 20% by weight based on the weight of said lactone polyesters of an ethylenically unsaturated monomer having the general formula:

$$CH_2{=}CR'$$

wherein R is a monovalent radical selected from the group consisting of -H and methyl and R′ is phenyl.

3,864,435

OLIGOMERIC PHOSPHORODIAMIDATE

Haakon Haugen, Beacon, N.Y., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 210,238, Dec. 20, 1971, Pat. No. 3,810,838. This application Sept. 19, 1973, Ser. No. 398,612

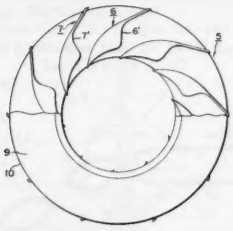
Int. Cl. C07f 9/24

U.S. Cl. 260—926 4 Claims

1. A method of preparing an oligomeric O-alkyl-N,N′-bis(alkaryl)phosphorodiamidate having an average of 1 to 4 phosphorodiamidic groups therein and a phosphorus content between about 2 and 10 wt. percent comprising contacting an amine of the formula RNH_2 where R is alkaryl of from 12 to 24 carbons with an alkyl dihalophosphate of the formula:

$$R'O\text{-}\overset{\overset{O}{\|}}{P}\text{-}X$$
$$\quad\quad\quad

ward the other side of the flow passage partway across the flow passage and narrowing the width of said flow passage,



with the width of said flow passage being enlarged on opposite sides of said projecting portion.

3,864,439

GAS-LIQUID CONTACTING APPARATUS

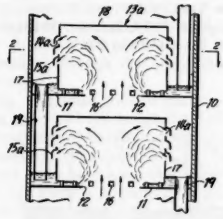
Shogo Tanigawa, and Takesi Yokoyama, both of Tamanoshi, Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd, Tokyo, Japan

Filed Dec. 12, 1972, Ser. No. 314,380

Claims priority, application Japan, Dec. 29, 1971, 47-2666; Dec. 21, 1971, 46-21439; Dec. 21, 1971, 46-21440

Int. Cl. B01f *3/04*

U.S. Cl. 261—114 R **1 Claim**



1. Gas-liquid contacting apparatus comprising a column having trays provided at spaced intervals, each tray being provided with a weir means for maintaining a depth of liquid thereon, a downcomer communicating with the weir means, openings communicating with the space below the tray, gas-liquid contacting devices surrounding said openings each having a cover to prevent gas and liquid from ascending and a wall having a plurality of rectangularly-shaped inclined gas-liquid apertures, and a deflecting plate located adjacent each aperture at the outside of the wall to deflect downwardly and tangentially a gas-liquid mixture flowing outwardly through the apertures.

3,864,440

HUMIDIFIER AND HEATER FOR DELIVERED GAS

George Giocoechea, Chicago, Ill., assignor to Respiratory Care, Inc., Elk Grove Village, Ill.

Continuation-in-part of Ser. No. 219,697, Jan. 21, 1972, Pat. No. 3,757,082. This application Aug. 2, 1973, Ser. No. 384,940

Int. Cl. B01f *3/04*; **A61m** *15/00*

U.S. Cl. 261—122 **8 Claims**

1. A humidifier for delivered gases, including

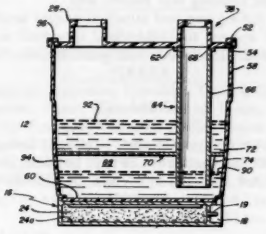
a water container having continuous sidewalls and a bottom wall,

a top cover for the water container,

an inlet on the cover for introduction of water and gas,

an outlet in the cover for discharge of humidified gas, and

a gas conveying assembly within said water container, said assembly having a gas delivery tube and a diffuser plate, said plate having a continuous edge extending to and contacting the sidewalls of the container to define a gas rebound chamber between the plate and the bottom of the container, the gas delivery tube having a major portion of its length extending from the plate to the inlet on the cover, and a minor portion extending below the diffuser plate but stopping short of the bottom, said minor length being operable to maintain a gas plenum between



a body of water in the rebound chamber and a body of water above the plate, said body of water above the plate raising the level of water in the rebound chamber above the end of the minor portion of the tube when the level of the water in the rebound chamber falls below the end of said minor portion, thereby maintaining the gas plenum under pressure, said gas delivery tube joining said plate adjacent an edge portion, said outlet passage in the cover being above the plate adjacent an opposite edge portion, and said plate having a plurality of apertures spreading towards the remaining edge portions of the plate.

3,864,441

DIFFUSED AERATION PIPE APPARATUS FOR USE WITH AN AERATION TANK

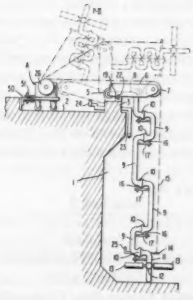
Shigeru Suzuki, Ageo, Japan, assignor to Nigata Engineering Co., Ltd., Tokyo, Japan

Filed May 17, 1974, Ser. No. 470,780

Claims priority, application Japan, Aug. 30, 1973, 48-101713; May 17, 1973, 48-54863

Int. Cl. B01d *47/02*

U.S. Cl. 261—122 **8 Claims**



1. In an aeration tank having an air supply pipe mounted on a support adjacent one of the upper edges of said tank, an aeration piping system comprising:

a. a first pipe having one end pivotably attached to said air supply pipe, the other end opening generally horizontally,

b. a plurality of generally U-shaped pipes each having

their ends pivotably jointed, one of said pipes having one end pivotably attached to said other end of said first pipe,

c. aeration diffusion means attached to an open end of one of said plurality of pipes,

d. means attached to said plurality of pipes adjacent each of said pivot joints to limit the angle of rotation between said joined pipes,

e. means selectably engaging said first pipe to prevent said first pipe from moving relative to said supply pipe,

f. guide means pivotably attached to said support,

g. reversible rotating reel means, and

h. a cable having one end attached to said reversible rotating reel means, the other end attached to the piping system and passing over said guide means.

3,864,442

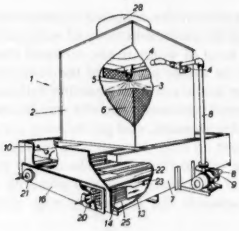
COOLING SYSTEM

Andrew Wilson Percy, Glasgow, Scotland, assignor to Hall-Thermotank International Limited, London, England

Filed June 11, 1973, Ser. No. 368,890

Int. Cl. B01f *3/04*

U.S. Cl. 261—151 **6 Claims**



1. Cooling apparatus for cooling a fluid flow, comprising in combination; a vertical casing; a discharge outlet for primary liquid arranged at an upper part of the vertical casing so as to discharge a downward flow of primary liquid within the casing; means for creating an induced or forced draft of gas to mix with the primary liquid within the casing for heat exchange between the gas and the primary liquid; a reservoir for primary liquid at the foot of the vertical casing including vertical baffle means defining a series of parallel culverts within the reservoir; the culverts being arranged for sinuous flow of primary liquid therethrough; an end channel located at one end of the reservoir; an inlet to the reservoir for flow of primary liquid from the end channel into the reservoir for flow therethrough; duct means in the casing for directing primary liquid to said end channel; an outlet for primary liquid from the reservoir; recycling conduit means for recycling primary liquid from the reservoir outlet to the primary liquid discharge outlet; heat exchange conduit means for secondary liquid extending into the culverts so that heat exchange occurs between the primary and secondary liquids in the reservoir; and an inlet to and an outlet from the heat exchange conduit means for secondary liquid.

3,864,443

METHOD OF MAKING LIGHT-WEIGHT CONCRETE AGGREGATE

Arthur Hopkins, Stove Bridge Rd., Cornwall, N.Y.

Filed May 27, 1970, Ser. No. 40,786

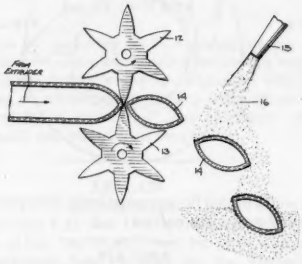
Int. Cl. C03c *25/02*; **B29d** *23/00*; **B28b** *11/06*

U.S. Cl. 264—42 **10 Claims**

1. The method of making aggregate for use in a concrete matrix, said method comprising the steps of:

A. continuously extruding a tube of moldable material through a die, said material having structural characteristics suitable for an aggregate, said tube having a diameter appropriate to aggregate,

B. sealing and sectioning the tube to form individual aggregate elements; and



C. treating the surface of the individual elements, while still moldable, to improve their adhesion characteristics.

3,864,444

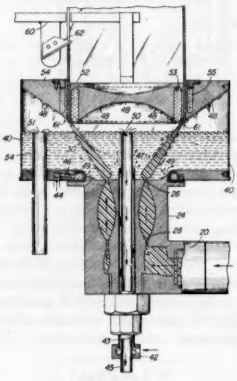
METHOD OF PRODUCING A FOAMED POLYSTYRENE SHEET HAVING A DENSITY GRADIENT DECREASING FROM THE EXTERNAL SURFACES INWARDLY

David Emil Johnson, Macedon, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 4, 1973, Ser. No. 394,039

Int. Cl. B29d *27/00*

U.S. Cl. 264—48 **4 Claims**

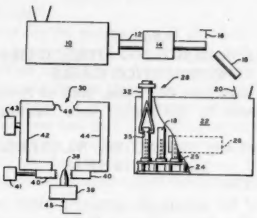


1. In the method of producing a polystyrene foam sheet by forming an extrudable, foamable mass comprising polystyrene; extruding such mass in tubular form; drawing said tubular extrudate over a forming calender ring of a diameter greater than the extruded diameter of said tubular extrudate; and then slitting said tube to convert such into flat sheeting; the improvement which comprises extruding such foamable composition directly into boiling water maintained at substantially the same height, both inside and outside said tubular extrudate; foaming said extrudate in said boiling water under cooling conditions whereby said tubular extrudate as formed has a density gradient decreasing from the external surfaces inwardly.

3,864,445
GRASPING PARISON PREFORM AT RIGHT ANGLE TO MOLD PARTING LINE

Jimmie L. Dean, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 220,970, Jan. 26, 1972, Pat. No. 3,758,254. This application June 29, 1973, Ser. No. 375,145
Int. Cl. B29c *17/07*
U.S. Cl. 264—89 **6 Claims**

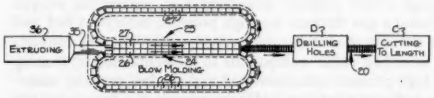


1. A method for forming biaxially oriented hollow articles comprising:
- forming a tubular extrudate of an extrudable polymer;
- cooling said extrudate to a solid state;
- severing said thus cooled extrudate into an individual open end parison preform;
- passing said open end parison preform, while in a vertical position, through an oven to reheat same;
- applying pressure to opposed sides of an open end of said parison to flatten and grip same and to thereby align said parison such that the axis thereof is coincident with a plane passing through the longitudinal direction of the flattened end;
- transferring said thus gripped parison into position in a molding zone with the longitudinal direction of said flattened end aligned parallel to the direction of travel of mold halves forming said zone;
- moving said mold halves together to form a molding zone, bottom wall forming portions of said mold halves cooperating to further align said parison such that the axis thereof is also coincident with a plane perpendicular to the longitudinal direction of said flattened end and to thereafter seal and sever said parison at a point adjacent said flattened end;
- introducing fluid pressure to expand said parison out into conformity with said molding zone; and
- removing the thus formed article.

3,864,446
METHOD OF CONVERTING CORRUGATED PIPE MOLDING MACHINE

Ernest J. Maroschak, Roseboro, N.C., assignor to Plastic Tubing, Inc., Roseboro, N.C.

Division of Ser. No. 261,780, June 12, 1972, Pat. No. 3,784,346. This application Dec. 10, 1973, Ser. No. 422,993
Int. Cl. B29c *17/07, 17/10, 17/16*
U.S. Cl. 264—95 **12 Claims**

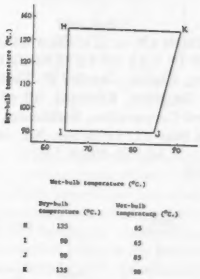


1. In a method of molding plastic pipe wherein an annular tube of molten plastic material is extruded and directed into a molding machine having pairs of cooperating mold sections arranged to receive the extruded tube and move the same through an elongate molding zone and wherein at least some of the mold sections have alternating semicircular transverse ribs and valleys with the ribs and valleys of one section of each pair cooperating with the ribs and valleys of the other section of the same pair to form respective annular valleys and ribs on the plastic pipe being molded therein, the improvement comprising positioning and securing at least one insert in one of the valleys of at least one of the mold sections and thereafter molding plastic pipe against the mold section whereby the insert serves for forming an interrupting gap in the corresponding rib being molded.

3,864,447
METHOD OF PRODUCING ACRYLIC COMPOSITE FIBERS

Hideto Sekiguchi, Kanaoka; Nobuhiro Tsutsui, Sumiyoshicho, and Takehiko Sumi, Kanaoka, all of Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Continuation of Ser. No. 672,634, Oct. 3, 1967, abandoned. This application Feb. 4, 1972, Ser. No. 223,795
Claims priority, application Japan, Oct. 7, 1966, 41-68532; Oct. 7, 1966, 41-68533; Oct. 7, 1966, 41-68534
Int. Cl. D01d *5/22*
U.S. Cl. 264—168 **11 Claims**



	Dry-bulb temperature (°C.)	Wet-bulb temperature (°C.)
H	135	65
I	90	65
J	90	85
K	135	90

1. A method of producing an acrylic composite fiber consisting of two components arranged in layers in side-by-side relationship throughout the length of the fiber, which comprises wet-spinning two different acrylic spinning solutions to form a composite fiber, washing the composite fiber with water, stretching the composite fiber to form a swollen gel fiber having a moisture content of at least 40%, relaxing the swollen gel fiber for 5 – 20 minutes, without drying, in hot water or steam at 60° – 130°C in a non-tensioned state, and drying the relaxed fiber under correlated conditions of temperature and humidity within the graphical area defined by coordinates of wet-bulb temperature-ordinate, dry-bulb temperature-abscissa in °C of 65,135, 65,90 85,90 and 90,135, the spinning solutions being selected to provide fiber components respectively formed therefrom having a difference in degree of irreversible swelling of 0.05 –3 so as to cause a difference in shrinkage between the fiber components.

3,864,448
DRY-SPINNING TETRACHLORINATED ARMOATIC POLYESTER FILAMENTS FROM METHYLENE CHLORIDE SOLUTIONS

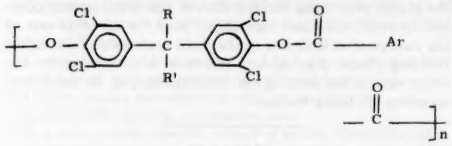
Robert W. Stackman, Morris Township, and Clifford M. Vogt, Madison, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Aug. 17, 1972, Ser. No. 281,585
Int. Cl. D01f *7/00*
U.S. Cl. 264—205 **6 Claims**

1. An improved dry-spinning process for forming aromatic polyester filaments which comprises extruding a stable solution consisting essentially of

from about 70 to 82 percent by weight of the solution of methylene chloride; and

from about 30 to about 18 percent by weight of the solution of a polymer having a recurring structural formula:



wherein n is so chosen that the molecular weight of the polymer is from about 10,000 up to about 200,000 and R and R′ may be the same or different and represent lower alkyl groups or hydrogen or may, together, constitute a cyclic hydrocarbon; and Ar is a mixture of from about 20 to about 40 percent paraphenylene and from about 80 to about 60 percent metaphenylene; the stable solution having a viscosity of from about 100 to about 3,000 poises,

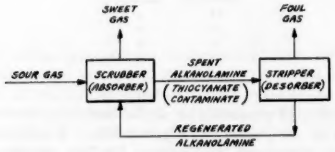
through an opening into an evaporative atmosphere for the methylene chloride to form the filaments in the absence of polymer phase-out from said solution prior to said extrusion.

3,864,449

REGENERATION OF ALKANOLAMINE ABSORBING SOLUTION IN GAS SWEETENING PROCESSES

Otto A. Homberg, Easton; Charles W. Sheldrake, Bethlehem, and Alan H. Singleton, Emmaus, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed May 17, 1973, Ser. No. 361,389
Int. Cl. B01d *53/34*
U.S. Cl. 423—228 **18 Claims**



1. In combination with an aqueous alkanolamine absorption/desorption process wherein industrial gases are sweetened by removal of acid gases including hydrogen cyanide and sulfide gases, a process for preventing irreversible deterioration of the alkanolamine solution comprising:

maintaining sufficient ammonium ions in the alkanolamine solution during absorption to insure a continued presence of said ammonium ions in the alkanolamine solution during the absorption process, said ammonium acting as a deterrent with respect to the formation of thiocyanates whereby irreversible deterioration of said alkanolamine solution by said thiocyanates is suppressed.

3,864,450

PROCESS FOR REMOVING NITROGEN OXIDES FROM GASEOUS MIXTURES

Tetsu Takeyama; Ryoh Endoh, and Keizo Masuda, all of Nagoya, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed June 23, 1972, Ser. No. 265,643
Claims priority, application Japan, June 24, 1971, 46-45243
Int. Cl. B01d *53/34*
U.S. Cl. 423—239 **5 Claims**

1. In a process for the removal of a nitrogen oxide impurity from a gaseous mixture, wherein the gaseous mixture subjected to the treatment contains both a nitrogen oxide impurity and oxygen, the steps comprising contacting the gaseous mixture with a catalyst consisting essentially of carbon impregnated with sodium hydroxide or potassium hydroxide, while maintaining said catalyst at a temperature in the range from about 250° C. to 480° C.

3,864,451

METHOD FOR REMOVING NITRIC OXIDE FROM COMBUSTION GASES

Yuan C. Lee, and Jules M. Kline, both of Newport Beach, Calif., assignors to Environics, Inc., Huntington Beach, Calif.

Filed Aug. 16, 1973, Ser. No. 281,034
Int. Cl. B01d *53/34*
U.S. Cl. 423—239 **3 Claims**

1. A method for selectively removing nitric oxide in the presence of sulfur dioxide from a flue gas containing nitric oxide, oxygen, carbon monoxide, carbon dioxide, water vapor and between 10 parts per million and 300 parts per million of sulfur dioxide, which comprises: mixing ammonia with said flue gas, the amount of ammonia, by volume, being at least equal to the volume of nitric oxide, and contacting the resulting mixture of flue gas and ammonia with a platinum catalyst on a support at a temperature between about 550°F and 600°F.

3,864,452

PROCESS FOR PURIFYING SULFUR COMPOUND CONTAMINATED GAS STREAMS

Chang W. Chi; Hanju Lee, both of Columbia, and Philip K. Maher, Baltimore, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Mar. 30, 1972, Ser. No. 239,459
Int. Cl. C01b *17/00;* **B01j** *9/04, 9/08, 9/12, 9/16, 9/20;* **C01b** *17/02*
U.S. Cl. 423—244 **17 Claims**

1. A cyclic four-stage method for purifying a sour gas stream by removing sulfurous contaminants therefrom comprising providing at least four high pressure adsorbent beds and at least two low pressure adsorbent beds; at least two of said high pressure adsorbent beds being on adsorption steps during any of said four stages, and at least two of said high pressure adsorbent beds being on regeneration steps and interconnected to a low pressure adsorbent bed during any of said four stages whereby during regeneration said contaminants which had been removed from the sour gas are not allowed to pass into the atmosphere; said adsorption steps comprising passing the sulfurous contaminated gas to said high pressure adsorbent beds to adsorb said sulfurous contaminants and flow a purified gas therefrom; said regeneration steps comprising depressurizing a high pressure adsorbent bed through a low pressure adsorbent bed, passing an oxygen containing gas through the high pressure adsorbent bed and then through the low pressure adsorbent bed thereby converting adsorbed sulfur compounds to elemental sulfur; heating the high pressure adsorbent bed and the low pressure adsorbent bed to greater than 825°F by passage of a heated gas and collecting said elemental sulfur, cooling said high pressure adsorbent bed and said low pressure adsorbent bed and purging said adsorbent beds to remove any oxygen containing gases prior to switching the high pressure adsorbent bed to an adsorption step.

3,864,453

PROCESS FOR THE PRODUCTION OF ALKALI FERROCYANIDE

Helmut Reinhardt, Rodenkirchen; Karl Trebinger, and Gottfried Kallrath, both of Wesseling, all of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt (Main), Germany

Filed Mar. 20, 1973, Ser. No. 343,171

Claims priority, application Germany, Mar. 27, 1972, 2214827

Int. Cl. C01c *3/12*

U.S. Cl. 423—367 **11 Claims**

1. A process for the production of an alkali or ammonium ferrocyanide comprising (1) reacting at 10° to 100°C. an aqueous solution of calcium hexacyanoferrate (II) with an aqueous solution of an iron (II) salt, washing the insoluble iron (II) hexacyanoferrate II complex formed with water until it is free of calcium ions and then (2) adding an aqueous solution of sodium, potassium or ammonium cyanide at 20° to 200°C. to the washed product to form an aqueous solution of the corresponding alkali or ammonium hexacyanoferrate (II).

3,864,454

PROCESS FOR THE PRODUCTION OF ALKALI PERCARBONATE

Horst Pistor, Rheinfelden, Germany; Edmund Simmersbach, deceased, late of Reinfelden, Germany; by Ingeborg Mohler, heiress, Denzlingen, Germany; Artur Schaller, Rheinfelden, Germany, and Gerd Knippschild, Wehr, Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Rossler, Postfach, Germany

Filed May 30, 1973, Ser. No. 365,249

Claims priority, application Germany, June 2, 1972, 2227014

Int. Cl. C01b *15/10*

U.S. Cl. 423—415 **9 Claims**

1. A process for producing alkali metal percarbonate comprising spraying solid alkali metal carbonate with aqueous hydrogen peroxide solution having a concentration of 35 to 90% and holding the alkali metal percarbonate at either (1) a time of between about 10 minutes and about 30 minutes at about 40° to 60°C. or (2) at a time between about 30 minutes and 110 minutes at 30° to 40°C. in a thin layer and then drying at 20° to 90°C. in a carbon dioxide containing gas which is either pure carbon dioxide or a mixture of carbon dioxide with air.

3,864,455

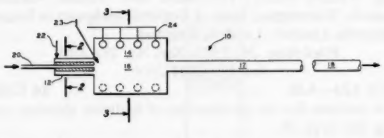
CARBON BLACK STRUCTURE REDUCTION USING A URANIUM ADDITIVE

John W. Vanderveen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 10, 1972, Ser. No. 295,827

Int. Cl. C01b *31/02*; **C08h** *17/08*

U.S. Cl. 423—450 **8 Claims**



1. In a process for making carbon black by the thermal decomposition of a fluid hydrocarbon feed in a carbon black forming zone at a temperature of greater than 1,700°F, the improvement comprising introducing into said zone from 1—1000 parts by weight of uranium per million parts by weight of feed.

3,864,456

MANUFACTURE OF CHLORINE DIOXIDE, CHLORINE AND ANHYDROUS SODIUM SULPHATE

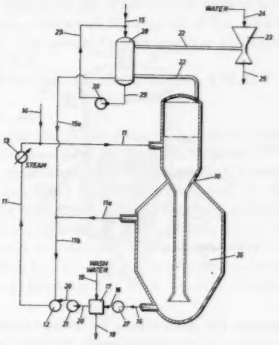
John D. Winfield, Scarborough, Ontario; Herbert C. Scribner, Islington, Ontario, and James D. Mc Gilvery, Port Credit, Ontario, all of Canada, assignors to Electric Reduction Company of Canada, Ltd., Toronto, Ontario, Canada

Continuation of Ser. No. 471,132, July 12, 1965, abandoned. This application June 3, 1970, Ser. No. 41,762

Claims priority, application Great Britain, Aug. 13, 1964, 33093/64

Int. Cl. C01b *11/02*

U.S. Cl. 423—478 **7 Claims**



1. A continuous process for the generation of chlorine dioxide and chlorine and the production of anhydrous sodium sulphate (Na_2SO_4) which comprises: maintaining an aqueous reaction solution containing sodium chlorate, sodium chloride and sulphuric acid and having an acidity between about 1.0 and 2.4 molar in a reaction zone, in the proportions required to generate chlorine dioxide and chlorine from the reaction solution by continuously feeding sodium chlorate, sodium chloride and sulphuric acid to said reaction zone, maintaining said reaction zone under subatmospheric pressure, maintaining the reaction solution at its boiling point at the prevailing absolute pressure on said reaction solution, and at a temperature between about +30°C. and a temperature above which substantial decomposition of said chlorine dioxide would occur, to evaporate water continuously from said reaction solution, continuously generating chlorine dioxide and chlorine from said reaction solution, continuously forming a gaseous mixture of said generated chlorine dioxide and chlorine and evaporated water in said reaction zone, continuously withdrawing said gaseous mixture from said reaction zone, continuously precipitating said Na_2SO_4 from said reaction solution in said reaction zone, and recovering said Na_2SO_4 from said reaction zone.

3,864,457

PROCESS FOR THE PRODUCTION OF CHLORINE DIOXIDE

Howard H. Hoekje, Akron, and Cletus N. Welch, Clinton, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 22, 1972, Ser. No. 317,569

Int. Cl. C01b *11/02*; **C01d** *5/02, 5/00*

U.S. Cl. 423—480 **8 Claims**

1. A process for the generation of chlorine dioxide which comprises

a. introducing sulfur dioxide and chlorine to an equilibrated, acidic alkali metal chlorate reaction liquor which is 5.0 to 6.4 normal in sulfuric acid, 0.9 to 1.7 molar in chlorate, and contains chloride in a concentration of from 0.1 to 0.6 molar to form chlorine dioxide and alkali metal sulfate;

b. neutralizing the reaction liquor to an acid level of 4.5 normal or less; and

c. precipitating and recovering alkali metal sulfate from the reaction liquor.

3,864,458

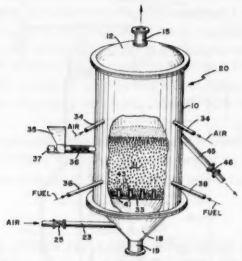
FLUID BED INCINERATION OF CHLORIDE-CONTAINING WASTE STREAMS

Ellicott J. Roberts, Westport, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed June 11, 1973, Ser. No. 368,535

Int. Cl. C01b *7/08*; **C01d** *5/00*; **C01f** *11/40*

U.S. Cl. 423—481 **9 Claims**



1. A process for destruction by incineration of aqueous, primarily organic combustible waste including as a contaminating constituent one or more chlorides of the alkali and alkaline earth metals, comprising the steps of,

a. establishing a fluidized bed of inert particles which is maintained in the fluidized state by an upward flow of an oxygen-containing gas,

b. introducing the aqueous combustible waste directly into said fluidized bed for combustion therein,

c. maintaining the operating temperature of said fluidized bed in he range from 1150°F to 1450°F by in-bed combustion of said aqueous waste and introduction of additional fuel directly into said bed as required to assure odor-free destruction of said waste,

d. preventing formation of low-melting eutectics in said fluidized bed and consequent defluidization by introducing sulfur into said bed for reaction in the fluidized bed environment with said chloride-containing contaminant and with carbonates formed during combustion, thereby forming an inert ash composed of relatively refractory sulfur-containing compounds of said alkali and alkaline earth metals and the volatile reaction product, HCl, and

e. removing said HCl with the exhaust combustion gases and disposing of said inert ash.

3,864,459

PROCESS FOR THE ECONOMICAL USE OF REFRACTORY REDUCING GASES FOR THE REDUCTION OF SULFUR DIOXIDE

Alvin B. Stiles, 1301 Grayson Rd., Wilmington, Del. 19803

Continuation-in-part of Ser. No. 818,026, April 21, 1969, abandoned. This application Mar. 26, 1971, Ser. No. 128,558

Int. Cl. C01b *17/04*

U.S. Cl. 423—564 **8 Claims**

1. In a process of reducing sulfur dioxide with a refractory gas selected from the group methane, ethane, benzene, natural gas and mixtures thereof to produce elemental sulfur, hydrogen sulfide, carbonyl sulfide, and carbon disulfide, along with carbon monoxide and elemental hydrogen which can be further utilized in reduction of SO_2, and carbon dioxide and water; the improvement for providing substantially complete oxidation of the refractory gas at efficient space velocities and temperatures, which comprises contacting, in essentially stoichiometric proportion, a reactant gas stream comprising sulfur dioxide and the refractory reducing gas with a supported catalyst selected from the group consisting of the oxides of manganese, chromium, barium, strontium, calcium, tantalum, and the rare earth chromites and mixtures and solid state reaction products thereof in combination with thoria and lanthanum at a temperature of at least 650°C. at a space velocity of at least 100 $hr.^{-1}$.

3,864,460

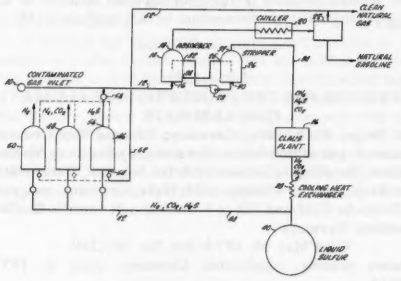
METHOD FOR REMOVING HYDROGEN SULFIDE FROM HYDROCARBON GAS STREAMS WITHOUT POLLUTION OF THE ATMOSPHERE

Joseph A. Connell, Fountain Valle, Calif., assignor to NRG Incorporated, Phoenix, Ariz.

Filed July 12, 1973, Ser. No. 378,395

Int. Cl. C01b *17/02*; **B01d** *53/02*

U.S. Cl. 423—574 **2 Claims**



1. A method for removing hydrogen sulfide from a gas stream and substantially eliminating air pollution from tail gas comprising the steps of:

passing a hydrogen sulfide contaminated input gas through a hydrogen sulfide absorber to remove hydrogen sulfide therefrom and produce a resultant clean gas output stream;

converting a portion of the removed hydrogen sulfide to sulfur in a sulfur conversion plant;

passing tail gas containing unconverted hydrogen sulfide from the sulfur conversion plant to an adsorber plant to thereby reversibly adsorb substantially all of the unconverted hydrogen sulfide; and

periodically desorbing said adsorbed unconverted hydrogen sulfide and recycling the desorbed hydrogen sulfide into the hydrogen sulfide absorber and sulfur conversion plants to effect further conversion of hydrogen sulfide to sulfur, whereby substantially all of the hydrogen sulfide in the input gas is ultimately converted to sulfur and sulfur containing tail gas is not vented to the atmosphere.

3,864,461

PROCESS FOR THE PRODUCTION OF ALUMINA

Arthur William Miller, Frodsham, and William Atkinson, Penketh, Warrington, both of England, assignors to Laporte Industries Limited, London, England

Filed Aug. 29, 1972, Ser. No. 284,540

Int. Cl. C01f *7/14*

U.S. Cl. 423—628 **16 Claims**

1. A process for the production of hydrous alumina comprising the steps of:

forming an aqueous solution of aluminum sulphate having a concentration of at least 2% by weight calculated as Al_2O_3,

forming an aqueous solution of sodium aluminate,

forming a mixture of the solutions to precipitate hydrous alumina in the form of a slurry, having a concentration of from 2% to 7% by weight, by introducing the sodium

aluminate solution, until the mixture reaches a composition of from 10% excess aluminum sulphate to 10% excess sodium aluminate, and until the resulting solution has a pH in the range between 7.3 to 10, at such a rate and with sufficient agitation that a substantial proportion of the hydrous alumina precipitates under acidic conditions, whilst maintaining the mixture at a temperature within a range selected from the ranges 12° to 35°C and 45° to 70°C

separating the hydrous alumina from its mother liquor and washing the separated hydrous alumina.

3,864,462
PROCESS FOR PRODUCING ALUMINA MONOHYDRATE FROM BASIC ALUMINUM NITRATES

Charles P. Bruen, Basking Ridge, and Donald H. Kelly, Gladstone, both of N.J., assignors to Reynolds Metal Company, Richmond, Va.

Continuation of Ser. No. 730,936, May 2, 1968, abandoned
Filed June 18, 1970, Ser. No. 48,919
Int. Cl. C01k *7/02, 7/34*
U.S. Cl. 423—631 **1 Claim**

1. The process for producing alumina monohydrate which comprises: (1) adding to a basic aluminum nitrate having the empirical formula

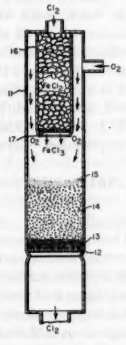
$$Al_2O_3 \cdot xAl(NO_3)_3 \cdot yH_2O$$

wherein x is a numeral from 0.667 to 6.0 inclusive, and y is a numeral from 4 to 38 inclusive, about 7.2 moles H_2O to about 28.2 moles H_2O per mole of NO_3 in said basic aluminum nitrate to provide an aqueous solution having in solution a nitrate concentration between about 10 percent and about 25 percent by weight calculated as NO_3, respectively, (2) heating said solution at a temperature between about 180°C. and about 235°C. under autogenous pressure for a period sufficient to convert substantially all the free alumina in the basic aluminum nitrate to solid alumina monohydrate, wherein oxides of nitrogen released therefrom are substantially N_2O_5, and (3) recovering the alumina monohydrate thus produced.

3,864,463
PROCESS FOR MANUFACTURE OF ALPHA FE_2O_3 PLATELETS

Tze Chao, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 358,861, May 10, 1973, abandoned. This application Mar. 11, 1974, Ser. No. 449,723
Int. Cl. C01g *49/02*; **C09c** *1/24*; **C01b** *7/02*
U.S. Cl. 423—633 **3 Claims**



1. In a process for the manufacture of α-Fe_2O_3 by the reaction of an oxygen-containing gas with $FeCl_3$ in the vapor phase at a temperature of 400°–750°C. in a static bed of inert particles, the improvement for producing α-Fe_2O_3 in platelet form having a particle diameter of from about 2 to 100 microns and a ratio of diameter to thickness of at least 4 wherein the reaction is effected in the presence of inert generally spheroidal particles having an average diameter not in excess of 1 mm, there being present in the bed an alkali metal halide in an amount of 0.01 to 10 percent based upon the weight of particles, and the linear velocity of gas through the bed being from 0.3 cm/sec. to about 10 cm/sec.

3,864,464
PREPARATION OF BERYLLIUM HYDRIDE

Lawrence H. Shephard, Jr.; Paul Kobetz, both of Baton Rouge; Roy J. Laran, Greenwall Springs, all of La., and Robert W. Johnson, Jr., Savannah, Ga., assignors to Ethyl Corporation, New York, N.Y.

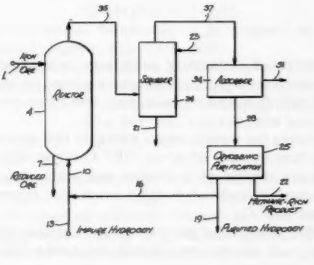
Filed Jan. 27, 1965, Ser. No. 430,237
Int. Cl. C01b *6/00*
U.S. Cl. 423—645 **9 Claims**

1. Process for the preparation of beryllium hydride which comprises reacting, at a temperature of from 75° to about 200°C., an organodiborane of the general formula $R_4B_2H_2$ with a dihydrocarbyl beryllium compound of the general formula $R_2'Be$ wherein R and R' represent radicals selected from the group consisting of alkyl, monocyclic cycloalkyl and monocyclic aryl radicals containing from 1 to about 10, 5 to about 10 and 6 to about 10 carbon atoms, respectively, and recovering beryllium hydride from the reaction product.

3,864,465
PRODUCTION OF HIGH PURITY HYDROGEN

Franklin D. Hoffert, Mountainside, N.J., assignor to Hydrocarbon Research, Inc., New York, N.Y.

Filed Dec. 15, 1972, Ser. No. 315,418
Int. Cl. C01b *1/26, 1/28, 1/32*
U.S. Cl. 423—648 **3 Claims**



1. A process for the purification of an impure hydrogen stream having a hydrogen content of below 90% and containing impurities including one or more members selected from the group consisting of carbon dioxide, carbon monoxide, oxygen, nitrogen, water vapor, hydrogen sulfide and hydrocarbon substances which comprises:

a. feeding said impure hydrogen stream through a fluidized bed of iron ore wherein said bed is maintained at a pressure between 100 and 1000 psi and at a temperature between 600° and 1100°F whereby impurities in the hydrogen are converted and iron oxide present in the iron ore is reduced to iron metal;

b. removing said hydrogen stream and said converted impurities from said bed;

c. separating said converted impurities from said hydrogen;

d. removing a purified hydrogen product stream containing at least 90 percent hydrogen.

3,864,466
PROCESS FOR OBTAINING DEUTERIUM

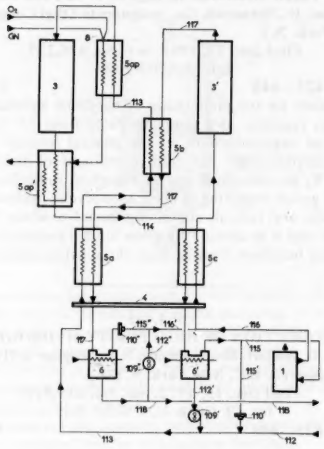
Jean Trichet, Orangis; Guy Simonet, Paris, and Jean-Pierre Guellaff, Vincennes, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude, Paris, France

Filed Jan. 20, 1971, Ser. No. 108,073

Claims priority, application France, Jan. 27, 1970, 70.02779

Int. Cl. C01b *4/00, 5/02*

U.S. Cl. 423—648 **7 Claims**



1. A process for obtaining deuterium comprising:

a. passing first a gaseous stream consisting of water vapor and hydrogen to a metallic mass consisting essentially of divided iron;

b. oxidizing the metallic mass with said first gaseous stream at a temperature of about 800° C to provide a second gaseous stream of hydrogen and water vapor, which leaves said oxidized metallic mass at a temperature of about 400° C.;

c. cooling said second gaseous stream, condensing the water from said second stream and separating the hydrogen from the water;

d. recycling at least a portion of the water separated in step (c) to said first stream used in oxidizing step (b);

e. separating deuterium in a manner known per se from at least a portion of the hydrogen from step (c) to provide deuterium-free hydrogen;

f. regenerating the metallic mass with a third gaseous stream consisting of hydrogen and water vapor at a temperature of about 400° C. said stream being free of deuterium, to obtain a fourth gaseous stream of water vapor and hydrogen which leaves said metallic mass at a temperature of about 800° C.;

g. cooling said fourth stream of water and hydrogen from step (f) to condense the water, and separating the water from the hydrogen; and

h. mixing the hydrogen from step (g) with at least part of the deuterium-free hydrogen from step (e) and using the hydrogen mixture for said third gaseous stream for said regeneration step (f).

3,864,467
METHOD FOR DIAGNOSIS OF INFECTIOUS MONONUCLEOSIS

E. Juhani Leikola, Helsinki, Finland, assignor to Orion-yhtyma Oy. Orion Pharmaceutical Co., Helsinki, Finland

Filed Apr. 12, 1972, Ser. No. 243,421

Claims priority, application Finland, Apr. 14, 1971, 1032

Int. Cl. G01n *31/02, 33/16;* **C12k** *1/00*

U.S. Cl. 424—12 **6 Claims**

1. A method for diagnosis of infectious mononucleosis comprising forming an absorbent by treating sheep or horse red blood cells with a proteolytic enzyme or neuraminidaze in order to destroy the mononucleosis receptors, hemolyzing the red blood cells by adding a hemolyzing agent, separating the resulting stromata from the hemoglobin, and preparing a stroma suspension from the stromata and diluted saline which suspension is free from blood cells interfering with the diagnosis; and mixing blood serum to be tested, said absorbent and sheep or horse blood on a slide whereby if mononucleosis antibodies are present agglutination takes place.

3,864,468
ACTIVATED POLYMER MATERIALS AND PROCESS FOR MAKING SAME

Seymour Hyman, New York, N.Y.; Bruce S. Bernstein, Somerville, N.J., and Ramesh Kapoor, Seaford, Del., assignors to Herculite Protective Fabrics Corporation, New York, N.Y.

Division of Ser. No. 112,053, Feb. 2, 1971, Pat. No. 3,705,938, Continuation-in-part of Ser. No. 593,267, Nov. 10, 1966, abandoned. This application May 19, 1972, Ser. No. 255,250

Int. Cl. A61l *3/00*

U.S. Cl. 424—16 **10 Claims**

1. A polymeric article having insecticidal properties comprising

a solid, non-porous, polymeric substrate, and

a solid, non-porous layer of a polymeric composition adherently applied to at least one surface of said substrate, said composition containing at least one insecticidal activating agent distributed within said polymeric composition and capable of migrating from said layer into and throughout said substrate, said agent being present in said layer in sufficient amount so that upon migration from said layer into said substrate an effective level of insecticidal activity is provided throughout said substrate, and on at least one other surface of said substrate which is not in direct contact with said layer.

3,864,469
XANTHINES IN PHARMACEUTICAL PREPARATIONS AND FOR STABILIZATION OF VITAMINS

Mario Reiser; Lothar Nouk, both of Wiesbaden, and Emil Eidebenz, Mainz-Gonsenheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 145,347, May 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 782,462, Dec. 9, 1968, abandoned. This application Feb. 8, 1973, Ser. No. 330,654

Claims priority, application Germany, Dec. 16, 1967, 1617418

Int. Cl. A61k *27/12, 15/00, 15/12*

U.S. Cl. 424—22 **28 Claims**

1. A therapeutically-active and pharmaceutically-acceptable solidified homogeneous intimate admixture of

a. at least one pharmaceutically-active substance and

b. at least one molten pharmaceutically-active substance; at least one active substance of which is more rapidly and at least one of which is more slowly absorbable;

the solidified homogeneous admixture comprising, as two of the pharmaceutically-active substances:

I. a xanthine which is substituted in each of two of the 1-, 3- and 7-positions by an alkyl group having at most two carbon atoms and is substituted in the remaining of said positions by:

a. a hydrocarbon group having from 3 to 20 carbon atoms and being bound by an acyclic carbon atom which is part of such group, or
b. an aliphatic hydrocarbon group substituted by at least one substituent selected from the group consisting of hydroxy and oxo, the hydrocarbon group having from 6 to 20 carbon atoms, being saturated or olefinically unsaturated, and being bound by an acyclic carbon atom which is part of such group; and

II. a member selected from the group consisting of nicotinic acid, a therapeutically-active derivative of nicotinic acid, an unstable vitamin and a therapeutically-active equivalent thereof selected from the group consisting of a salt, an ester and a provitamin thereof;

the xanthine being present in the admixture in a proportion sufficient to stabilize any unstable vitamin therein.

3,864,470

VISUALLY CLEAR TOOTHPASTE CONTAINING A SYNTHETIC PRECIPITATED HYDRATED SILICA

Charles Andrew Watson, Ruislip, England, assignor to Lever Brothers Company, New York, N.Y.

Filed July 16, 1973, Ser. No. 379,295

Claims priority, application Great Britain, July 21, 1972, 34358/72

Int. Cl. A61k *7/16*

U.S. Cl. 424—49 **2 Claims**

1. A visually clear toothpaste comprising a particulate solid polishing agent and a liquid phase of substantially the same refractive index as the polishing agent, characterised in that the polishing agent comprises a synthetic precipitated hydrated silica of average aggregate particle size of from about 2 to about 30 microns, said synthetic precipitated hydrated silica being present in an amount of from about 5 to about 50 percent by weight of the toothpaste.

3,864,471

STABLE DENTIFRICES CONTAINING A MONOFLUOROPHOSPHATE, AN INSOLUBLE METAPHOSPHATE, AND CALCIUM CARBONATE

William James King, River Edge; Leo Thomas Murray, East Brunswick, and Gerhard Martin Salzmann, Franklin Lakes, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 878,241, Nov. 19, 1969, abandoned, which is a continuation-in-part of Ser. No. 785,731, Dec. 20, 1968, abandoned. This application Sept. 9, 1971, Ser. No. 176,396

Int. Cl. A61k *7/16*

U.S. Cl. 424—52 **5 Claims**

1. A packaged dentifrice composition comprising an unlined aluminum container and in contact therewith a dentifrice composition comprising a water-soluble monofluorophosphate in amount which provides about 0.01-1% by weight fluorine to the dentifrice and about 20-95% by weight of a water-insoluble compatible polishing material consisting essentially of a mixture of calcium carbonate and an insoluble alkaline metal metaphosphate wherein the ratio of said carbonate to said metaphosphate is about 3:1 to about 1,000:1.

3,864,472

CLEAR LEMON-FLAVORED MOUTHWASH

Philip Pensak, New Brunswick, and Joseph P. Januszewski, Somerville, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 6, 1972, Ser. No. 304,040

Int. Cl. A61k *7/16*

U.S. Cl. 424—54 **3 Claims**

1. A visually clear lemon flavored mouthwash formulation comprising

a. from about 60 to about 95 percent by weight of water
b. from about 5 to about 25 percent by weight of an alcohol chosen from the group consisting of ethanol and isopropanol
c. from about 0.05 to about 1.0 percent by weight of lemon oil
d. from about 0.1 to about 5.0 percent by weight of polyoxyethylene (20) sorbitan monoisostearate and
e. from about 0.01 to about 0.1 percent by weight of an anti-bacterial agent chosen from the group consisting of benzethonium chloride, diisobutyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride, N-alkylpyridinium chloride, N-cetyl pyridinium bromide, sodium N-lauroyl sarcosine, sodium N-palmitoyl sarcosine, lauroyl sarcosine, N-hyristoyl glycine, and potassium N-lauroyl sarcosine
f. the weight ratio of said surfactant to said lemon oil being greater than about 1.5 to 1.

3,864,473

SUBSTANTIVE POLYMERIC SUNSCREEN COMPOSITION

Joseph P. Claudelli, Ramsey, N.J., assignor to Avon Products, Inc., New York, N.Y.

Filed June 12, 1972, Ser. No. 261,621

Int. Cl. A61l *23/00*

U.S. Cl. 424—60 **9 Claims**

1. A method of protecting the human skin from erythema inducing ultraviolet radiation which comprises applying to the skin a composition containing from 1 percent to about 75 percent based on the total weight of the composition of a polymeric reaction product of at least one p-di-C_1-C_4-alkylaminobenzoyl halide with polyethylenimine having an average molecular weight ranging from about 500 to 100,000 in a topical skin cosmetic carrier material selected from the group consisting of water-lower alcohol mixture, and an aminal, vegetable and mineral oil base.

3,864,474

SUNSCREENING COMPOSITIONS CONTAINING SULFONIUM SALTS

John Fred Gerecht, Somerville, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 820,280, April 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 492,316, Oct. 1, 1965, abandoned. This application May 28, 1971, Ser. No. 148,158

Int. Cl. A61l *23/00*

U.S. Cl. 424—60 **2 Claims**

1. A sunscreening composition comprising from 0.1 percent to 25 percent by weight of 3-paranitrobenzamidopropyldodecylmethyl sulfonium bromide as a skin-substantive sunscreening agent having a prominent spectral absorption peak within the range of 250–400 millimicrons and a skin-compatible, non-toxic carrier which is compatible with said agent.

3,864,475

METHOD OF TREATING HUMAN HAIR TO ENHANCE SOFTNESS AND IMPROVE THE GENERAL APPEARANCE THEREOF

John W. Willard, Sr., 1314 S. Seventh St., Rapid City, S. Dak. 57701

Continuation-in-part of Ser. No. 317,097, Dec. 20, 1972, which is a continuation of Ser. No. 108,198, Jan. 20, 1971, abandoned. This application Aug. 16, 1973, Ser. No. 388,775

Int. Cl. A61k *7/06*

U.S. Cl. 424—70 **21 Claims**

1. A method of treating human hair to enhance softness and improve the general appearance thereof comprising

intimately contacting the hair with an effective amount of an aqueous treating composition containing water and an

effective amount of a catalyst until the softness of the hair is enhanced and the general appearance thereof is improved,

the catalyst being prepared by a process comprising admixing a water soluble alkali metal silicate with an aqueous medium containing a dissolved substance which is a source of calcium ion and a dissolved substance which is a source of magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide between about 1×10^{-4} and 1×10^{-1} mole per liter each of calcium ion and magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide a molar ratio of calcium ion to magnesium ion between about 2.0:1.0 and 1.0:2.0;

the alkali metal silicate having an alkali metal oxide to silicon dioxide ratio between about 0.0:1.0 and less than 2.0:1.0 and being admixed with the aqueous medium in an amount of about 0.05–2 moles per liter,

reacting the alkali metal silicate with said dissolved substances providing calcium ion and magnesium ion to produce an aqueous suspension of finely divided particles of the reaction product,

admixing a micelle-forming surfactant with the aqueous medium in an amount to form catalyst micelles comprising said finely divided particles of the reaction product upon agitating the aqueous medium, and

agitating the aqueous medium containing said finely divided particles of the reaction product and surfactant to form said catalyst micelles.

3,864,476

SOLUTION FOR PERMANENT COLD WAVING OR STRAIGHTENING OF HAIR

Frederick J. Altieri, 40 Edna St., Bridgeport, Conn. 06610

Continuation-in-part of Ser. No. 356,159, April 1, 1973,. This application Apr. 8, 1974, Ser. No. 458,528

Int. Cl. A61k *7/10*

U.S. Cl. 424—71 **9 Claims**

1. A hair treating lotion comprising an aqueous solution including:

a sulphur dioxide source in the range of 1.910 to 4.92 parts by weight selected from the group consisting of sodium bisulphite, potassium meta-bisulphite, potassium bisulphite, sodium sulphite and potassium sulphite,

a borate source in the range of 0.637 to 4.10 parts by weight selected from the group consisting of sodium borate and potassium borate,

a carbonate source in the range of 0.637 to 4.10 parts by weight selected from the group consisting of sodium carbonate, sodium bicarbonate, and potassium carbonate, and

an alkanol amine in the range of 1.274 to 9.84 parts by weight selected from the group consisting of monoethanolamine, diethanolamine, triethanolamine, triethylene tetramine, and triisopropanolamine.

3,864,477

NEW COMPOSITIONS

Yvonne Thuillier, Paris, and Marcel Antoine Perrault, Saint Cloud, both of France, assignors to Albert Rolland S.A., Paris, France

Continuation-in-part of Ser. No. 110,271, Jan. 27, 1971, abandoned, which is a continuation of Ser. No. 709,897, March 4, 1968, abandoned. This application Apr. 12, 1973, Ser. No. 350,530

Int. Cl. A61k *19/00*

U.S. Cl. 424—94 **3 Claims**

1. A method for treating stria distensae, and *pseudoxanthoma elasticum* which comprises applying topically to a human host in need of such treatment a cosmetic composition, in a therapeutically effective amount, comprising an elastolytically active enzymatic material prepared from delipidated pancreatic material, said enzymatic material having an isoelectric point of about 9.5 ± 0.5, a slight solubility in water having a pH below 4.5, peaks in the ultraviolet spectrum at 2,200 and 2,800 A and having two main constituents, the first constituent of said enzymatic material electrophoretically demonstrates a mobility slower than gamma globulins and digests elastin and the second constituent electrophoretically demonstrates a mobility comparable to $\beta 1$ and $\beta 2$ globulins, said enzymatic material being produced in accordance with the following steps:

1. conventional extraction of the pancreas with acetone and ether to obtain a delipidated pancreas powder;
2. extraction of said powder with an M/100 sodium acetate buffer at a pH between 4.8 and 5;
3. precipitation of active material by addition to extract of ammonium sulfate in a concentration of between about 48 to 55%;
4. demineralization of said precipitate of active material by dialysis;
5. fractional precipitation with ethanol or methanol comprising the steps of:
   a. a first precipitation in about 50% ethanol or methanol to remove inactive material, and
   b. a second precipitation in about 80% ethanol or methanol of active material;
6. solution of active material in an M/100 sodium acetate buffer at a pH between 4.7 and 5; and
7. lyophilization, said steps being carried out at a temperature less than about 5°C;

and wherein the amount of said enzymatic material present in said cosmetic composition is from about 0.01 to about 1% by weight, further comprising calcium chloride in amount sufficient to stabilize said cosmetic composition and polyethyleneglycols having mean molecular weights of 400 and 4000, in equal quantities, the pH of the composition being adjusted between 6.8 and 8.0 with HCl as a neutralizing agent.

3,864,478

STORAGE-STABLE HEMOGLOBIN SOLUTIONS AND METHOD FOR THEIR PREPARATION

Klaus Bonhard, Sandeldamm 16, Hanau, Germany

Filed Oct. 3, 1973, Ser. No. 403,141

Claims priority, application Germany, Oct. 3, 1972, 2248475

Int. Cl. A61k *17/00*

U.S. Cl. 424—101 **15 Claims**

1. Method for obtaining a hemoglobin solution having a stabilized 2,3-diophospho-glycerate level which method comprises

a. treating a starting material containing human erythrocytes with a diluted solution of β-propiolactone at temperatures between 5° and 15°C. to result in a mixture containing β-propiolactone in an amount of from 4 to 12 g per liter of erythrocyte sediment, thereafter treating the mixture with a neutral or weakly alkaline washing solution to wash out the excess β-propiolactone and its reaction products,

c. then mixing the erythocytes with distilled water to form a hemolysate which is treated with a cation exchange resin in H^+—form, until the pH-value has dropped to 5.0 to 5.5, to result in precipitation of a stroma-lipid mass,

d. separating the hemolysate from the resin and the precipitated stroma mass by centrifuging, and e. recovering the hemoglobin solution by sterile filtration.

3,864,479

BOROMYCIN AS A COCCIDIOSTAT

Brinton M. Miller, Middletown, and Richard W. Burg, Murray Hill, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 28, 1974, Ser. No. 446,875
Int. Cl. A61k *21/00, 27/00*
U.S. Cl. 424—185 3 Claims

1. A method for treating coccidiosis in poultry which comprises orally administering to an animal susceptible to coccidiosis an anticoccidially effective amount of a compound selected from the group consisting of boromycin or a salt thereof.

3,864,480

CINERUBIN A AND B AS ANTIPARASITIC AGENTS

Ching C. Wang, Watchung, N.J., Justo Martinez Mata, and Sebastian Hernandez, both of Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 6, 1974, Ser. No. 467,324
Int. Cl. A61k *21/00*
U.S. Cl. 424—120 3 Claims

1. A method for the prevention and treatment of coccidiosis in poultry which comprises orally administering to poultry an anti-coccidially effective amount of Cinerubin A, Cinerubin B, or a non-toxic acid addition salt thereof.

3,864,481

ANTI DISEASE PRODUCING SYNTHETIC MATERIAL FOR THE PREVENTION SUPPRESSION AND DIAGNOSIS OF MULTIPLE SCLEROSIS AND METHOD OF TREATMENT THEREFOR

George A. Hashim, Barney Park, N.Y., assignor to St. Luke's Hospital, New York, N.Y.

Filed Dec. 14, 1972, Ser. No. 315,140
Int. Cl. A61k *27/00*
U.S. Cl. 424—177 9 Claims

1. The method of treating a mammal which is useful for the prevention, suppression and diagnosis of multiple sclerosis which comprises:

administering to said mammal from about 0.001 mg to about 1,000 micrograms per kilogram of body weight of a synthetic material having the general formula selected from the class consisting of compounds of the formula:

$$(R_1—R_2—R_3—Gln - R_4—R_1)$$

where;

each R_1 is an animo acid residue;

R_2 is selected from the class consisting of Trp and Tyr;

R_3 is an amino acid residue;

R_4 is selected from the class consisting of Lys, Arg and His;

a is 0–4; *b* and *c* are each 0 or at least 1 and *n* is at least 1;

and compounds of the formula:

$$(R_5—Gln — R_4—R_1)$$

where;

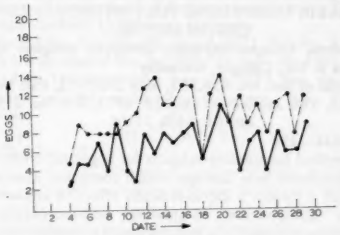
R_5 is selected from the class consisting of R_1 and R_2 as defined above; and R_4, b, c and n are as defined above.

3,864,482

METHOD FOR FACILITATING EGG-LAYING RECUPERATION OF HEN UNDER MOULTING AND AQUEOUS PREPARATION THEREFOR

Etsuo Naito, Han-Nou, and Katsuhide Tanaka, Toyota, both of Japan, assignors to Eisai Co., Ltd., Bunkyo-ku, Tokyo, Japan

Filed Oct. 3, 1973, Ser. No. 403,073
Claims priority, application Japan, Oct. 9, 1972, 47-100657
Int. Cl. A61k *27/00*
U.S. Cl. 424—177 5 Claims



1. A method for facilitating egg-laying recuperation of hen during moulting which comprises administering 1.0γ– 30γ of LH-RH through intramuscular injection to hen under natural or artifically forced moulting.

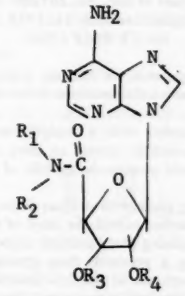
3,864,483

ADENOSINE-5′-CARBOXYLIC ACID AMIDES

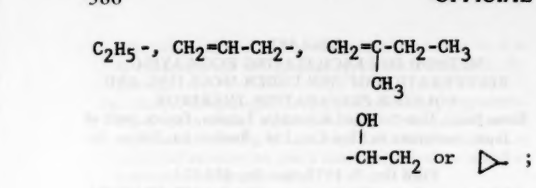
Herman Hal Stein, Skokie, Ill., and Raj Nandan Prasad, Pierrefonds, Quebec, Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 236,980, March 22, 1972, , which is a continuation-in-part of Ser. No. 125,893, March 18, 1971,. This application June 14, 1973, Ser. No. 370,084
Int. Cl. A61k *27/00*
U.S. Cl. 424—180 1 Claim

1. A method of relieving inflammation and its concommitant symptoms of pain, swelling and tenderness in a mammalian patent comprising administering to said patient a therapeutically effective amount of a compound of the formula



wherein R_1 is



R_2 is hydrogen; R_3 and R_4 are hydrogen with the provision that when R_1 is cyclopropyl, R_3 and R_4 are hydrogen or acetyl.

3,864,484

THERAPEUTIC COMPOSITIONS AND METHODS USING SILYMARIN COMPRISING POLY-HYDROXYPHENYL CHROMANONES

Rolf Madaus, Cologne-Merheim, Germany, assignor to Dr. Madaus & Co., Cologne, Germany

Division of Ser. No. 828,353, May 27, 1972, Pat. No. 3,777,932. This application May 19, 1972, Ser. No. 255,177

Int. Cl. A61k *27/14*

U.S. Cl. 424—195 **7 Claims**

1. A method for treating subjects for hepatitis, cirrhosis or chemical-induced liver damage, which comprises administering to such a subject a therapeutically effective amount of a Silymarin composition comprising polyhydroxyphenyl chromanones obtained by a process which comprises the steps of (1) subjecting the dried fruits of *Silybum marianum Gartn.* to high mechanical pressure whereby the cell walls of the fruits are ruptured and the major amount of fatty oils contained in the fruits is separated therefrom, (2) exhaustively extracting the remaining solid residue which still contains fatty oils in an amount of about 5 to 10 percent with ethyl acetate, (3) evaporating the ethyl acetate, (4) dissolving the oil-greasy, partially lumpy dry residue thereby obtained in a solvent mixture comprising methanol, water and petroleum ether whereby an upper phase and a lower phase are formed and wherein said chromanones are contained in the lower phase, (5) centrifuging said solvent mixture to remove any solid material present therein and separating the upper and lower phases, (6) thereafter subjecting the liquid portion comprising the lower phase to multiple counter-current contact with petroleum ether, whereby a thorough mixing and separation of both phases occurs, and (7) recovering the polyhydroxyphenyl chromanones from the lower phase by evaporation of the solvent to dryness.

3,864,485

SCRUBBER

Caperton B. Horsley, Wellesley, and Edward F. Kent, Brockton, both of Mass., assignors to Braxton Corporation, Medfield, Mass.

Continuation-in-part of Ser. No. 267,954, June 30, 1972, abandoned. This application May 14, 1973, Ser. No. 359,696

Int. Cl. B01d *53/14*

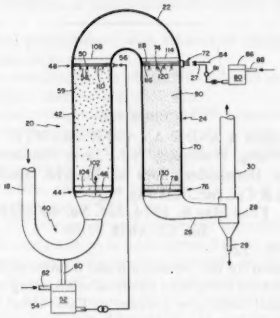
U.S. Cl. 423—210 **13 Claims**

1. Scrubbing apparatus for treating a stream of stack gas with an alkaline chemical to remove sulfur dioxide therefrom comprising

a treatment chamber with a straight reaction portion of uniform cross-section having an inlet and an outlet for said stream, said portion being free of flow disturbance therein,

a flow equalizing plate with orifices therein affixed in said treatment chamber across the inlet of said straight portion, said equalizing plate partially impeding said stream and producing a pressure drop greater than pressure differences transverse to the flow direction, said pressure drop having a gradient transverse to the flow direction of the stack gas compensating flow concentration by structure upstream of said equalizing plate to equalize the flow in said straight portion,

an isolating plate with orifices therein, affixed in said treatment chamber across the outlet of said straight portion, said isolating plate partially impeding said stream and producing a pressure drop greater than pressure differences transverse to the flow direction, said pressure drop produced by the isolating plate having a gradient transverse to the flow direction compensating pressure variations produced by structure downstream of said isolating plate to isolate flow within said straight portion from flow concentrating effects of downstream structure,



sprayers supported in said chamber at the inlet to said straight section and connected to a supply of said alkaline chemical dissolved in water close to its limit of solubility, said sprayers discharging a spray of drops predominantly less than 0.005 cm diameter uniformly distributed across the cross-section of said straight section, said sprayers discharging said alkaline chemical at a rate close to stoichiometric ratio to the sulfur dioxide in said stream,

a saturator chamber connected to said treatment chamber upstream thereof for saturating said stream with water vapor prior to entry into said treatment chamber, and

equipment connected to said treatment chamber downstream thereof for removing drops from said stream.

3,864,486

THERAPEUTIC COMPOSITIONS OF BROMAZEPAM AND SULPIRIDE

Johannes Ernst Blum, Basel, Switzerland, assignor to F. Hoffmann La Roche & Co. Aktiengesellschaft, Basel, Switzerland

Filed Sept. 12, 1973, Ser. No. 396,651

Claims priority, application Switzerland, Sept. 21, 1972, 13805/72

Int. Cl. A61k *27/00*

U.S. Cl. 424—244 **3 Claims**

1. A therapeutic composition possessing anxiolytic, antipsychotic, antidepressant and antiemetic activity comprising a therapeutically inert, pharmaceutically acceptable carrier material and, as an active ingredient, one part by weight bromazepam or the equivalent amount of a pharmaceutically acceptable salt thereof and from about 5 to about 200 parts by weight sulpiride or the equivalent amount of a pharmaceutically acceptable salt thereof.

3,864,487

ANTIARHYTHMIC PHARMACEUTICAL PREPARATION CONTAINING ETHYL 10-(β-MORPHOLYLPROPIONYL) PHENTHIAZINE-2-CARBAMATE HYDROCHLORIDE

Anna Nikitichna Gritsenko, Volokolamskoe shosse, 80, kv. 28; Jury Ivanovich Vikhlyaev, Dorogomilovskaya ulitsa, 6/8, kv. 12; Semen Vladimirovich Zhuraviev, Minsskaya ploschad, 3/8, kv. 38; Natalya Veniaminovna Kaverina, Noropeshanaya ulitsa, 3, kv. 32; Zlata Petrovna Senova, Mytnaya ulitsa, 23, korpus 2, kv. 67, and Olga Vasilievna Ulyanova, 2 ulitsa Oktyabrskogo polya, 21, kv. 46, all of Moscow, U.S.S.R.

Division of Ser. No. 870,444, Oct. 10, 1969, Pat. No. 3,740,395. This application Aug. 16, 1971, Ser. No. 172,216

Int. Cl. A61b *27/00*

U.S. Cl. 424—247 **5 Claims**

1. An antiarhythmic pharmaceutical preparation comprising an antiarhythmically effective amount of ethyl 10-(β-morpholylpropionyl)-phenthiazine-2-carbamate hydrochloride and a pharmaceutically acceptable carrier.

3,864,488

COMPOSITIONS CONTAINING A QUINOXALINE-5,10-DIOXIDE AND METHOD OF USING SAME

Florin Seng, Cologne; Kurt Ley, Odenthal-Globusch, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft

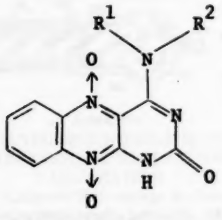
Division of Ser. No. 249,702, May 2, 1972, Pat. No. 3,814,756. This application June 11, 1973, Ser. No. 368,477

Claims priority, application Germany, May 7, 1971, 2122571

Int. Cl. A61k *27/00*

U.S. Cl. 424—248 **21 Claims**

1. An antimicrobial composition comprising an antimicrobially effective amount of a compound selected from the group consisting of a 1,2-dihydro-2-oxo-4-aminopyrimido[4,5-*b*]quinoxaline-5,10-dioxide of the formula:



wherein each of R^1 and R^2 independent of the other is lower alkyl of 1 to 6 carbon atoms or (lower alkoxy)lower alkyl in which "lower alkyl" contains 1 to 6 carbon atoms and "lower alkoxy" contains 1 to 6 carbon atoms or R^1 and R^2 together with the nitrogen atom to which they are attached are pyrrolidino, piperidino, hexamethyleneimino or morpholino; and a pharmaceutically acceptable acid addition salt thereof and an inert pharmaceutical carrier.

3,864,489

TREATMENT OF HYPERKINETIC CONDITIONS WITH CAFFEINE

Salvatore F. Biscardi, Cornwall, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 236,239, March 20, 1972, abandoned. This application Jan. 23, 1974, Ser. No. 435,902

Int. Cl. A61k *27/00*

U.S. Cl. 424—253 **4 Claims**

1. A method of alleviating hyperkinetic conditions, comprising orally administering to a subject exhibiting said conditions a dosage amount of caffeine effective to alleviate said conditions.

3,864,490

N-(ω-CYANO-ALKYL)-CARBAMYL BENZIMIDAZOLES USED AS INSECTICIDES, ACARICIDES AND OVICIDES

Werner Daum, Krefeld-Bockum; Hans Scheinpflug; Paul-Ernst Frohberger, both of Leverkusen, and Ferdinand Greene, Burscheid, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

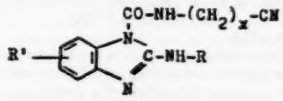
Division of Ser. No. 206,180, Dec. 8, 1971, Pat. No. 3,794,728, which is a division of Ser. No. 880,399, Nov. 26, 1969, Pat. No. 3,673,210. This application Aug. 29, 1973, Ser. No. 392,833

Claims priority, application Germany, Nov. 30, 1968, 1812000

Int. Cl. A01n *9/22*

U.S. Cl. 424—273 **11 Claims**

1. A method of combating insects, acarids, insect ova or acarid ova which comprises applying to **9a**) said insects, **9b**) said acarids, (c) said insect ova, (d) said acarid ova or (e) the corresponding habitats thereof, an insecticidally, acaricidally, or ovicidally effective amount of a N-(ω-cyano-alkyl)-carbamyl-benzimidazole of the formula



in which R is selected from the group consisting of hydrogen, alkoxycarbonyl of 2-5 carbon atoms and alkyl-carbonyl of 1–5 carbon atoms, R' is selected from the group consisting of hydrogen and alkyl of 1–3 carbon atoms, and x is a whole number from 1 to 11.

3,864,491

ANTIBACTERIAL AND ANTIFUNGAL 4,5-DIHALOPYRROLE-2-CARBONITRILES

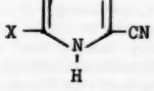
Denis M. Bailey, E. Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Nov. 4, 1971, Ser. No. 195,817

Int. Cl. A01n *9/22*

U.S. Cl. 424—274 **8 Claims**

1. An antibacterial or antifungal composition consisting essentially of an effective antibacterial or antifungal amount of a 4,5-dihalopyrrole-2-carbonitrile having the formula:



where X is chlorine, bromine or iodine as the active ingredient and a conventional diluent especially adapting the composition for application to areas to be disinfected of deleterious bacteria or fungi.

3,864,492
METHOD OF TREATING DEPRESSION USING 1,4'-DIHYDROXY-3-N-PENTYL-6,6,9-TRIMETHYL-6A,7,10,10A-TETRA-HYDRODIBENZO[B,D]PYRAN

Earl Elmer Fager, Lake Villa, and Norman Earl Wideburg, Waukegan, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 384,555, Aug. 1, 1973, abandoned, which is a division of Ser. No. 298,900, Oct. 19, 1972, Pat. No. 3,808,234. This application Mar. 21, 1974, Ser. No. 453,227

Int. Cl. A61k *27/00*

U.S. Cl. 424—283 **3 Claims**

1. A method of treating the symptoms of depression comprising administering a therapeutically effective amount of 1,4'-dihydroxy-3-n-pentyl-6,6,9-trimethyl-6*a*,7,10,10*a*-tetrahydrodibenzo[*b*,*d*]pyran to a patient in need of such treatment.

3,864,493
COMPOSITIONS AND METHODS FOR THE PREVENTION OF ASTHMATIC SYMPTOMS

Hugh Cairns, Sandbach, and Robert Minshull, Brereton, both of England, assignors to Fisons Limited, Felixstowe, Suffolk, England

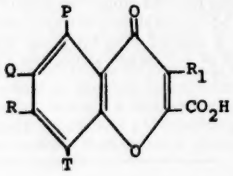
Division of Ser. No. 62,170, Aug. 7, 1970, Pat. No. 3,718,668, Continuation-in-part of Ser. No. 751,753, Aug. 12, 1968, abandoned. This application Dec. 8, 1972, Ser. No. 313,266

Claims priority, application Great Britain, Aug. 17, 1967, 37912/67; Apr. 2, 1970, 15577/70

Int. Cl. A61k *27/00*

U.S. Cl. 424—283 **12 Claims**

1. A pharmaceutical composition for the prevention of the ymptoms of asthma comprising an effective amount for the prophylactic treatment of asthma of a compound of formula,



I

in which one or more adjacent pairs of P, Q, R and T, together form the chain —CO—CR_1=C(COOH)—O— which may be bonded to the benzene ring in either sense; the remainder of P, Q, R and T are the same or different and each is hydrogen; alkyl containing from 1 to 10 carbon atoms, alkyl containing from 1 to 10 carbon atoms and carrying a halo; hydroxy; lower alkoxy; acetoxy; carboxy; amino; lower alkylamino; lower dialkylamino; or a hydroxylamino substituent group; unsaturated alkyl containing from 1 to 10 carbon atoms; phenylalkyl, halophenylalkyl or alkylphenylalkyl wherein the alkyl groups contain from 1 to 10 carbon atoms; phenyl; naphthyl, or phenyl and naphthyl carrying a halo; lower alkyl; nitro, carboxy or hydroxy substituent group; pyridyl; furyl; pyrrolyl; cycloalkyl containing from 4–6 carbon atoms; cycloalkyl containing from 4 to 6 carbon atoms and carrying a hydroxyl, lower alkoxy or carboxy substituent group; nitrile; nitro; nitroso; hydroxy; alkoxy containing 1 to 10 carbon atoms; alkoxy containing from 1 to 10 carbon atoms and carrying a hydroxy, lower alkoxy, carboxy, halo, amino, lower alkylamino, or lower dialkylamino substituent group; alkenloxy or alkynyloxy containing from 1 to 10 carbon atoms; benzyloxy; phenyloxy; naphthyloxy; pyridyloxy; cyclohexyloxy; cyclopentyloxy; epoxyloweralkoxy; amino; lower alkylamino; lower dialkylamino; cycloalkylamino containing from 4 to 6 carbon atoms; phenylamino; naphthylamino; diphenylamino; halologweralkylamino; lower alkenylamino; aminoloweralkylamino; hydroxylamino; lower alkanoyl amino; ureyl; thioureyl; guanidino; thiol; lower alkyl thiol; phenyl thiol; sulphonic acid, halogen or one or more of P, Q, R and T may be a group of OY wherein Y is an alkyl group having from 1 to 10 carbon atoms substituted by lower alkyl or phenyl-lower alkyl in which one or more of the CH_2 groups has been replaced by oxygen, sulphur or carbonyl, which alkyl or phenyl lower alkyl may carry one or more hydroxyl or carboxyl substituent groups; or an adjacent pair of P, Q, R and T (together with the adjacent carbon atoms in the benzene ring) together form a benzene ring, or a chain $-(CH_2)_4-$, $-(CH_2)_3-$, $-=C(COOH)-O-$, $-O(CH_2)_3-$, $-O(CH_2)_2-$, $-_3)=CH-CO-O-$, $-O(CH_2)_2O-$, $-CH_2-CH(CH-_3)-O-$, $-CH=CH-O-$, $-CH=C(CH_3)-O-$, $-OCH-_2O-$, $-NH-C(R^4R^5)-CH_2-O-$, $NR^5CH=CH-O-$ or $-NR^5CH=CH-NR^4-$ (wherein R^4 is hydrogen or lower alkyl or lower alkoxy and R^5 is hydrogen, or R^4 and R^5 together form a =O group), and each R_1 may be the same or different and is hydrogen, alkyl containing from 1–10 carbon atoms, alkoxy containing from 1–10 carbon atoms or phenyl, or a pharmaceutically acceptable salt thereof, in association with a pharmaceutically acceptable carrier or diluent.

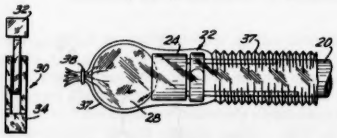
3,864,494
METHOD FOR PRODUCING A LARGE SAUSAGE PRODUCT HAVING A PRE-FLATTENED END

Vytautas Kupcikevicius, Chicago, and Michael Joseph Myles, Downers Grove, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 212,914, Dec. 28, 1971, Pat. No. 3,808,638. This application Mar. 18, 1974, Ser. No. 452,188

Int. Cl. A22c *11/00*

U.S. Cl. 426—284 **1 Claim**



1. A method for obtaining a large sausage product having a pre-flattened end including the steps of;

a. supporting a flat circular disc at the discharge end of a stuffing tube, the flat surfaces of the flat circular disc being disposed in general alignment with the longitudinal axis of the stuffing tube;

b. sheathing a large sausage casing having a closed end over the thusly supported flat circular disc and stuffing tube;

c. restraining said sausage casing adjacent the end of said stuffing tube in an annular passage;

d. rotating said flat circular disc within the said sausage casing until the flat surfaces of the flat circular disc are disposed transverse to the longitudinal axis of the stuffing tube;

e. gathering the large sausage casing over and about the stuffing tube until the closed end of the large sausage casing is drawn closely adjacent to one flat surface of the flat circular disc and the other flat surface of the flat circular disc abuts the discharge end of the stuffing tube, and;

f. admitting a food emulsion into the large sausage casing having the flat circular disc thusly positioned therein until the large sausage casing is stuffed with the food emulsion.

3,864,495

SULPHONAMIDES COMPOSITIONS AND METHOD FOR TREATING EDEMA

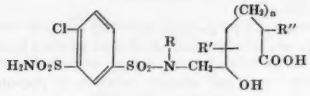
Harald Horstmann, Wuppertal-Vohwinkel; Hartmund Wollweber, and Karl Meng, both of Wup Pertal-Elberfeld, all of Germany

Division of Ser. No. 829,123, May 29, 1969, Pat. No. 3,629,442, which is a division of Ser. No. 643,822, June 6, 1967, Pat. No. 3,499,000. This application Aug. 10, 1970, Ser. No. 62,639

Int. Cl. A61k *27/00*

U.S. Cl. 424—319 **6 Claims**

1. A pharmaceutical composition useful in a human or animal to eliminate excess or undesired salt from the body fluids, in the treatment of edema and in the treatment of hypertension which consists of an effective amount of a compound of the formula:



wherein:

R is hydrogen or methyl;

R′ is hydrogen or lower alkyl;

R″ is hydrogen or lower alkyl; and

n is 0 or 1;

or a pharmaceutically acceptable non-toxic salt thereof, in combination with a pharmaceutically acceptable inert diluent or carrier.

3,864,496

1-SUBSTITUTED BIGUANIDES FOR TREATING GASTROINTESTINAL HYPERACIDITY OR ULCERATION

Julius Diamond, Lafayette Hill; George H. Douglas, Paoli, and Bernard J. Burns, Philadelphia, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 89,005, Nov. 12, 1970, abandoned. This application May 12, 1971, Ser. No. 142,794

Int. Cl. A61k *27/00*

U.S. Cl. 424—326 **15 Claims**

1. A method of treating gastrointestinal hyperacidity or ulceration in humans and mammals which comprises orally or parenterally administering thereto betwen 0.5 mg/kg – 70 mg/kg per day of a compound of the formula

where:

R_2 and R_6 are chloro or bromo and

R_4 is p-chlorophenyl or p-chlorophenoxy, and

a non-toxic acid addition salt thereof.

3,864,497

ACARICIDAL AND INSECTICIDAL 1,5-DIPHENYL-3-METHYL-1,3,5-TRIAZAPENTA-1,4-DIENER

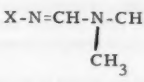
Ian Robert Harrison, Bleasby; John Felix McCarthy, Bramcote Hills, and Bryan Harper Palmer, Burton Joyce, all of England, assignors to Boots Pure Drug Company Limited, Nottingham, England

Division of Ser. No. 94,209, Dec. 1, 1970, Pat. No. 3,781,355, which is a continuation-in-part of Ser. No. 00,430, Jan. 2, 1970, abandoned. This application July 9, 1973, Ser. No. 377,840

Int. Cl. A01n *9/20*

U.S. Cl. 424—326 **8 Claims**

1. An acaricidal and insecticidal composition which comprises a carrier and, as the active ingredient, an acaricidally or insecticidally effective amount of a compound having the formula



in which X and Y are each selected from the group consisting of 2,3-dimethylphenyl, 2,4-dimethylphenyl, 2,6-dimethylphenyl, 2,4,6-trimethylphenyl, 2,4,5-trimethylphenyl, 2,3,4-trimethylphenyl, 2-methyl-4-halophenyl, 2-ethyl-4-halophenyl, 2-halo-4-methylphenyl, 2-halo-4,6-dimethylphenyl, 2,4-dihalo-6-methylphenyl, 2-methyl-4-methoxyphenyl, phenyl and methylphenyl, provided that (a) when X and Y are identical, they are not selected from the group consisting of phenyl and methylphenyl and (b) when X and Y are different, one of them is selected from the group consisting of 2,3-dimethylphenyl, 2,4-dimethylphenyl, 2,4,6-trimethylphenyl, 2,3,4-trimethylphenyl, 2-methyl-4-halophenyl and 2-halo-4-methylphenyl.

3,864,498

METHOD OF PREPARING A COLLAGENOUS SHRIMP AND FISH FEED

Robert A. Whitmore, 705 E. Mermaid Ln., Philadelphia, Pa. 19118, and Howard W. Jones, 49 Pawnee Rd., New Britain, Pa. 18901

Division of Ser. No. 294,958, May 19, 1972, abandoned. This application Aug. 30, 1973, Ser. No. 393,251

Int. Cl. A23k *1/18*

U.S. Cl. 426—1 **1 Claim**

1. A process for preparing an improved shrimp and fish feed, comprising the following steps:

a. mixing collagenous comminuted hide with water to obtain a suspension having a pH of about 6.5;

b. warming the comminuted hide suspension to a temperature above 40°C.

c. treating the warm comminuted hide suspension with a high shear field until the collagenous material becomes a viscous liquid homogenate containing about 7.0% solids and that is capable of forming a gel which will not melt upon prolonged boiling in water;

d. Combining the homogenate of step (c) with dried sweet whey powder and water to obtain a mixture containing from 3 to 5% of the homogenate and about 70% solids.

e. Extruding the mixture through a plate having perforations ranging in diameter from about 1/16 to about ⅛ inches to form rods;

f. Drying the extruded rods; and

g. Cutting the dried rods into pellet-sized lengths of feed that, upon being put in water, swell to a firm gel and do not disintegrate at temperatures up to 50°C.

3,864,499

ADJUVENT CONTAINING POLYMERIC SAUSAGE CASING AND METHOD OF PREPARATION

Albin F. Turbak, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 710,717, March 6, 1968, abandoned. This application July 20, 1970, Ser. No. 56,654
Int. Cl. A22c *13/00*
U.S. Cl. 426—138 **22 Claims**

1. A method of preparing an adjuvant-containing shaped article formed of a hydrophilic film-forming polymer which comprises

a. preparing a solution of at least one oil capable of forming colloidal sized particles or droplets when dispersed in the film-forming polymer and an oil-soluble adjuvant in an inert co-solvent which is soluble or dispersible in a solution of said film-forming polymer or a derivative thereof,
b. dispersing said solution of said oil and said oil-soluble adjuvant into said polymer-containing solution,
c. extruding the resulting dispersion to produce a shaped article,
d. coagulating and regenerating said extruded shaped article, and
e. removing said inert co-solvent to produce a dispersion of said adjuvant throughout said extruded article as a solution in fine particles or droplets of said oil of colloidal size.

3,864,500

PROCESS OF PREPARING AN EGG YOLK SUBSTITUTE AND RESULTING PRODUCTS FROM ITS USE

Charles C. Lynn, 102-30 66th Rd., Forest Hills, N.Y. 11375

Continuation-in-part of Ser. No. 144,328, May 17, 1971, abandoned. This application July 23, 1973, Ser. No. 381,416
Int. Cl. A23j *3/02*
U.S. Cl. 426—195 **27 Claims**

1. The process of preparing an egg yolk substitute comprising the steps of:

combining non-elastic protein material, oil and salt and heating at a low simmering temperature;
adding a mild acid to the foregoing and continuing heating for a period of time sufficient to bring out flavor characteristics;
adding water and vegatables and boiling;
adding additional water and non-elastic protein material and continuing boiling;
adding a thickening agent and continuing boiling to obtain a material of high protein content,
the foregoing ingredients forming said high protein material selected in such proportions that the protein content of said material is between approximately 25 and 55 percent of said material, the fat content is between approximately 5 to 15 percent of said material and the carbohydrate content is between approximately 25 and 50 percent of said material; and,
adding to the high protein content material a food grade emulsifier to form an egg yolk substitute, said food grade emulsifier comprising 1–12 percent, by weight, of said egg yolk substitute.

3,864,501

METHOD OF ENHANCING COLORATION OF FRUITS AND VEGETABLES WITH A DIALHYLAMINO-ALKOXYBENZENE

Henry Yokoyama; Wan-Jean Hsu, both of Pasadena, and Stephen M. Poling, Seal Beach, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 10, 1973, Ser. No. 404,980
Int. Cl. A23l *1/27*
U.S. Cl. 426—268 **16 Claims**

1. A process for enhancing the coloration of harvested fruits and vegetables which contain carotenogenic tissue, which comprises applying to the surface of the fruit or vegetable a compound of the structure

$$(Alk)_2N—(CH_2)_n—O—\phi—R'$$

wherein Alk is lower alkyl of 1–4 carbon atoms, n is an integer from 2 to 4, and R′ is a member of the group consisting of H, —OH, lower alkyl of 1–4 carbon atoms, and lower alkoxy of 1–4 carbon atoms; and holding the fruit or vegetable for a period long enough to develop an enhanced coloration.

3,864,502

METHOD FOR PREPARING PROTEIN FOOD PRODUCT

Takashi Sakita, and Gyoto Taguchi, both of Yokohama, Japan, assignors to Nisshin Seiyu Kabushiki Kaisha, Tokyo, Japan

Filed June 16, 1972, Ser. No. 263,444
Claims priority, application Japan, Mar. 8, 1972, 47-23792
Int. Cl. A23j *3/00*
U.S. Cl. 426—364 **1 Claim**

1. A process of preparing a spinning solution comprising

mixing a protein curd and an alkaline solution from an input line in an inline mixing means wherein the mixture of protein curd and alkaline solution is pressurized and passed to an outlet line of the inline mixing means,
passing a portion of the pressurized mixture of protein curd and alkaline solution from the outlet line of the inline mixing means through a first pipe back to the input line of the inline mixing means,
passing the remaining portion of the pressurized mixture of protein curd and alkaline solution from the outlet line of the inline mixing means through a second pipe into an open tank,
passing the mixture of protein curd and alkaline solution in the open tank into a third pipe,
filtering the mixture of protein curd and alkaline solution in the third pipe by applying the mixture of protein curd and alkaline solution in the third pipe under pressure to one side of a filter means to form a filtered mixture of protein curd and alkaline solution on the other side of the filter means, and
passing the filtered mixture of protein curd and alkaline solution from the other side of the filter means to a spinerette means.

3,864,503

METHOD OF PACKAGING SELF-BASTING POULTRY

Ken Steenolsen, South Pasadena, Calif., assignor to Poppy Food Company, Los Angeles, Calif.

Filed June 12, 1972, Ser. No. 261,819
Int. Cl. B65b *29/08, 25/22*
U.S. Cl. 426—232 **8 Claims**

1. The method of packaging a food item for self-basting cooking, comprising the steps of:

a. placing the food item inside a polyester bag which is open at one end;
b. inserting a selected quantity of semi-liquid basting and seasoning material into the bag at different points on the peripheral surface of the food item;
c. evacuating the bag through its open end, and then closing and sealing it;
d. briefly applying heat to the external surface of the bag sufficient to shrink the bag tightly around the food item and its accompanying basting and seasoning material, so as to spread the basting and seasoning material in a thin coating about the food item, said heat being effective to partially melt the basting and seasoning material; and
e. subjecting the bag and its contents to atmospheric temperature for a period of time sufficient to further disseminate the basting and seasoning material;

the packaged product being then adapted for quick cooking of the food item in the bag.

3,864,504

PROCESS TO PRODUCE HIGH CONCENTRATION TOMATO PUREE BY TRANSFORMING COLLOIDS

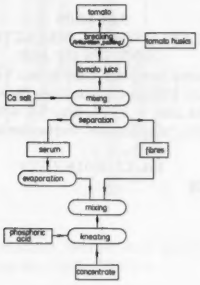
Zoltan Szabo, and Frigyes Hirschberg, both of Budapest, Hungary, assignors to Komplex Nagyberendezesek Export Import Vallalata, Budapest, Hungary

Continuation of Ser. No. 266,389, June 26, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,589

Claims priority, application Hungary, June 26, 1971, KO 243

Int. Cl. A23l *1/02*

U.S. Cl. 426—373 2 Claims



1. A process of producing tomato puree of high concentration, comprising triturating tomatoes to produce tomato juice and tomato husks, separating the tomato juice from the tomato husks, precipitating a coagulum in the tomato juice by adding a small but effective amount of calcium chloride to the tomato juice leaving a serum, said amount being effective to precipitate said coagulum, separating the coagulum and the serum, evaporating the serum, remixing the coagulum and the serum and adding to the remixed serum and coagulum a small but effective amount of a compound selected from the group consisting of phosphate and citrate whose cations have a valence of one, the latter said amount being effective to break the coagulum thereby to produce a high concentration tomato puree.

3,864,505

METHOD OF SHAPING FRIED FARINACEOUS DOUGH PRODUCTS AFTER REMOVAL FROM THE FRYING MEDIUM

John Earl Hunter, Springfield Township, Hamilton County, and Alexander Leon Liepa, Montgomery, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 294,730, Sept. 29, 1972, abandoned. This application May 28, 1974, Ser. No. 473,861

Int. Cl. A23l *1/10*

U.S. Cl. 426—346 17 Claims

1. In the process of preparing shaped, crisp snack foods from coherent farinaceous doughs, said process comprising preparing a coherent farinaceous dough, sheeting said dough, cutting said sheet into desired snack food pieces, completely frying said dough pieces in a frying oil to a final moisture content of 12 percent or less, and removing said completely fried dough pieces from the frying oil, the improvement comprising shaping said dough pieces into a desired uniform geometrical shape after removal from the frying oil but before said fried dough pieces become rigid.

3,864,506

PROCESS FOR PRETREATING RAW CHEESE WHEY

Donald A. Grindstaff, Minnetonka, Minn., and William P. Ahern, Visalia, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 20, 1974, Ser. No. 452,878

Int. Cl. A23c *21/00*

U.S. Cl. 426—356 6 Claims

1. A process for pretreating a raw cheese whey comprising:

a. forming a phosphate-treated solution of raw cheese whey by admixing raw cheese whey containing at least 70 percent (weight basis) sweet cheese whey with an alkali metal phosphate selected from the group consisting of potassium acid pyrophosphate, sodium acid pyrophosphate, potassium tripolyphosphate, sodium tripolyphosphate, tetrasodium pyrophosphate, tetrapotassium pyrophosphate, and mixtures thereof at a concentration from about 0.6 grams per liter to about 2.0 grams per liter at a pH from about 5.5 to about 4.0.

b. adjusting the pH of said phosphate-treated solution to a range of from about 6.5 to about 8.0 by the addition of a base to form a precipitate and a pretreated cheese whey and

c. separating said precipitate from said pretreated cheese whey.

3,864,507

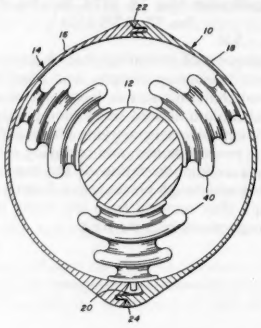
ELECTRICAL CONDUCTOR

D. Marshall Fox, Highton, Victoria, Australia, and Richard B. Weiss, Lower Burrell, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 25, 1974, Ser. No. 445,543

Int. Cl. H01b 9/06

U.S. Cl. 174—14 R 9 Claims



1. A conductor assembly for transmission of high voltage electrical power comprising a hollow cylindrical metal sheath, a core conductor, a plurality of insulators in the sheath at spaced intervals along the length thereof supporting the core substantially concentrically centered in the sheath, and compressed insulating gas in the sheath, said sheath comprising one or more elongate staves each of which comprises a portion of the circumference of the sheath and having a groove along one longitudinal edge thereof open toward the adjoining edge of the adjacent stave and a tongue along the other longitudinal edge projecting into the groove in the adjoining edge of the adjacent stave and the staves welded together along their adjacent longitudinal edges exteriorly of said tongue and groove engagement so that welding will not contaminate the interior of the sheath, and further having a particle trap in the interior surface of said sheath comprising a longitudinally extending upwardly open groove in the bottom of the sheath as disposed for use in the transmission of electrical power.

3,864,508

CARRIER FOR CONDUCTORS IN AN ELECTRICAL CABLE FOR LOW TEMPERATURE

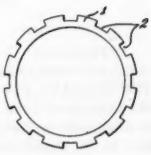
August Beck, Langenhagen, Germany, assignor to Kabel-und Mettallwerke Gutehoffnungshutte AG, Hannover, Germany

Filed Apr. 11, 1974, Ser. No. 460,028

Claims priority, application Germany, Apr. 13, 1973, 2318617

Int. Cl. H01v 11/00

U.S. Cl. 174—15 C 9 Claims



1. In an electrical cable to be operated at low temperatures and having several concentric tubes and electrical conductors in the innermost tube to be placed therein in immediate contact with a coolant flowing through the innermost tube, a carrier assembly for the conductors comprising:

a plurality of individual, cylindrical short tube sections as carrier elements having longitudinally running grooves in their outer periphery; and

connecting elements interconnecting the carrier elements with a gap between adjacently positioned carrier elements so that liquid coolant as flowing through the elements may pass through the gap for flow in and along the grooves, the conductors being disposed on the elements as interconnected.

3,864,509

COAXIAL CABLE WHOSE DIELECTRIC PARTLY CONSISTS OF AIR

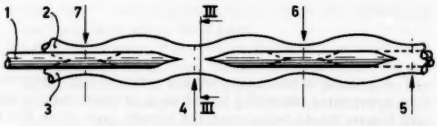
Hubertus Johannes Josephus Gommans, Venlo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 4, 1974, Ser. No. 430,789

Claims priority, application Netherlands, Feb. 2, 1973, 7301495

Int. Cl. H01b 11/18

U.S. Cl. 174—28 4 Claims



1. A coaxial cable having a dielectric which consists partly of air in which filaments of electrically insulating material serving as spacers around a central conductor, wherein the spacers consist of at least two filaments of electrically insulating material which surround the central conductor in accordance with spatial wavelines and which are interconnected at regular spaces over a short distance and thus jointly surround the entire circumference of the central conductor.

3,864,510

PEDESTAL CLOSURE FOR BURIED CABLE

Edward Lewis Ramsey, Jr., Martinsville, and Arnold Ray Smith, Chester, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

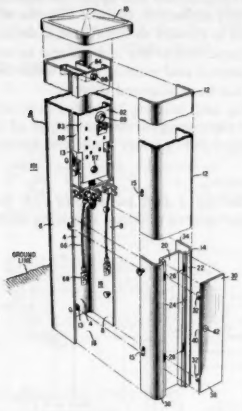
Filed Feb. 15, 1974, Ser. No. 442,851

Int. Cl. H02g 9/02

U.S. Cl. 174—38 14 Claims

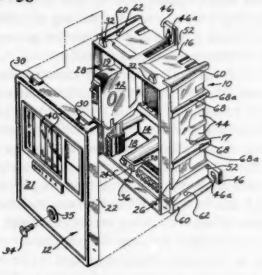
1. An enclosure for above-ground terminals of a buried cable installation comprising a rear member having a vertically elongated rear wall and forwardly projecting side walls, a cap at the top of said rear member, and upper and lower front cover members detachably secured to said rear member to define a terminal chamber for housing said terminals, characterized in that:

said lower front cover member includes a vertically oriented channel formed in the exterior face thereof adapted for



receiving conductors therein and providing access for said conductors into said chamber.

3,864,511
NON-METALLIC LOAD CENTER FOR SURFACE AND RECESSED WALL MOUNTING
John Alfred Morby, Bristol; Joseph Francis Rich, New Britain, and George Henry Grade, Jr., Simsbury, all of Conn., assignors to General Electric Comapny, New York, N.Y.
Filed June 14, 1973, Ser. No. 369,821
Int. Cl. H02g *3/08*
U.S. Cl. 174—58 **2 Claims**



1. An enclosure for electrical equipment comprising, in combination:

A. A molded, electrically insulative housing including a backwall and integrally formed, upstanding sidewalls,

1. said sidewalls terminating in a perimetrical lip circumscribing the open front of said housing,

B. A molded cover having

1. a front wall, and
2. a perimetrical flange integrally formed in perpendicular relation to said front wall;
3. said flange and lip arranged to telescopically interfit upon application of said cover to said housing in closure relation to the open front thereof;

C. a pair of spaced reinforcing ribs integrally formed with each of an opposed pair of said sidewalls and extending between said lip and said backwall, said ribs being formed to provide mounting surfaces lying in a common plane perpendicular to said front wall of said cover when applied in closure relation to said housing;

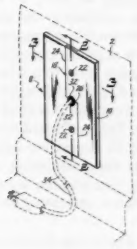
D. corner ribs integrally formed with said housing and extending exteriorly from each junction of said sidewalls, each said pair of reinforcing ribs located intermediate said corner ribs;

E. mounting means formed in each said corner rib to facilitate recessed mounting said enclosure to a wall stud,

1. whereby upon mounting said enclosure, said mounting surfaces bear against the side of the wall stud to orient said cover front wall in substantially parallel, flush relation to a finished wall; and

F. at least one mounting tab integrally formed with one of said sidewalls and extending exteriorly therefrom at a location adjacent said reinforcing ribs, said mounting tab facilitating mounting said enclosure to the surface of a wall.

3,864,512
COVER FOR UTILITY OUTLET
Theodore B. Meadow, 2610 Pine Valley Rd., Albany, Ga. 31707
Filed Feb. 13, 1974, Ser. No. 442,194
Int. Cl. H02g *3/14*
U.S. Cl. 174—66 **5 Claims**



1. A cover for a utility outlet box, said cover having a front face and a rear face, comprising:

two separable complementary side-by-side plate members arranged in edge abutment to define a generally rectangular cover, the abutting edges of at least the front face portions of said plate members defining a juncture line extending from one end of said cover, laterally offset from the center line thereof, to the opposite end, laterally offset to the other side of the center line and spaced inwardly from the side edges of said cover and thus having laterally offset end portions and an intermediate portion;

a front face portion of each plate adjacent a corresponding end portion of said juncture line being in overlapping relation to a rear face portion of the other plate, said rear face portions being spaced apart at said intermediate portion of said juncture whereby to leave the region behind said intermediate portion free of obstructions;

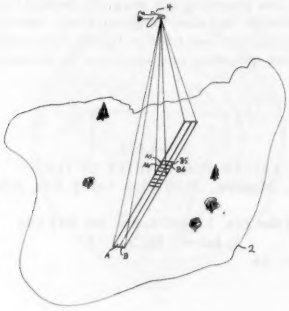
complementary means on said plate members, at said intermediate portion of said juncture, delineating an opening through said cover; and

aligned openings through said overlapping portions of said plate members for receiving fastening means to secure said cover to an outlet box and simultaneously hold said plate members in the described relationship.

3,864,513
COMPUTERIZED POLARIMETRIC TERRAIN MAPPING SYSTEM

John D. Halajian, Levittown, and Herbert B. Hallock, Huntington, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Sept. 11, 1972, Ser. No. 287,876
Int. Cl. H04b 9/00
U.S. Cl. 178—6.6 **16 Claims**



1. A system for mapping an array of terrain segments in order to display a map indicating the interrelationship between at least two polarimetric components of the natural light reflected from each segment comprising:

A. means for scanning the array to generate and store simultaneously a first and a second matrix of digital values corresponding to a first and a second polarimetric component value of the light reflected from segments of the array corresponding to respective values in the matrices,

B. computer means for performing a matrix operation with values from the first and the second matrix to derive values for a third matrix indicating said interrelationship, and

C. display means for displaying the values of the third matrix as said map.

3,864,514
FACSIMILE SYSTEM AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 225,172, Aug. 27, 1962, , which is a continuation-in-part of Ser. No. 668,348, June 27, 1957, Pat. No. 3,051,777, which is a continuation-in-part of Ser. No. 823,600, May 12, 1969, which is a continuation-in-art of Ser. Nos. 279,030, April 1, 1963, abandoned, and Ser. No. 723,075, Feb. 28, 1958, Pat. No. 3,084,213. This application Oct. 24, 1972, Ser. No. 300,424
Int. Cl. H04n 1/32
U.S. Cl. 178—6.8 **7 Claims**

1. Facsimile apparatus for transmitting and recording full-frame video picture information comprising in combination:

a television camera,

means for positioning a document containing a pictorial representation of information to be transmitted to a location remote from said camera, in the scanning field of said camera,

said camera having a reading electron beam and deflection control circuits for causing the reading-beam of the camera to rpedeterminately scan the image field presented to the camera,

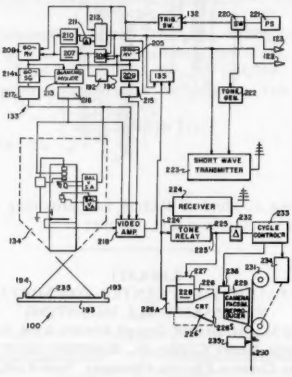
signal generating means for generating a sequence of deflection control signals and applying said signals to energize said deflection control circuits of said camera to cause said camera reading beam to full-frame scan its image field,

control means for said signal generating means including a control switch, an input circuit energized by closing said control switch for initiating operation of said signal generating means to generate and apply the signals generated thereby to said deflection control circuits whereby said reading beam is caused to full-frame scan the complete image field presented to the camera and to terminate the scanning action of said reading beam when the complete image field has been scanned thereby,

means including said reading beam for generating a composite video picture signal on the output of said camera including separable picture and synchronizing signal elements,

a receiving station,

means for effecting a communication link between the output of said camera and said receiving station,



receiving means at said receiving station operable for receiving the signals generated by said transmitting means, and including a video receiver having a cathode ray tube and write-beam generating means for generating an image on a display screen of said tube,

horizontal and vertical deflection control means for the write-beam of said receiving station cathode ray tube connected to receive signals from said receiving means, means at said receiving station for separating said synchronizing signal elements from the picture signal elements from each composite video picture signal received thereby and applying said synchronizing elements to said horizontal and vertical deflection control means for said write-beam of said receiving station cathode ray tube and for simultaneously applying the separated picture signal elements to intensity modulate said write-beam of said cathode ray tube to cause said beam to full-frame scan and generate an image on the display screen of said tube which image is representative of the document scanned by said television camera,

relay means connected to said receiving means of said receiving station and responsive to the code signal generated when said control switch is closed for conditioning said receiving means of said receiving station to receive signals generated by said sending station transmitting means,

means optically coupled to said display screen of said receiving station cathode ray tube for generating a hard copy reproduction of images generated by said display screen, and

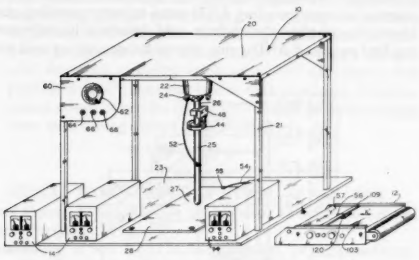
means at said receiving station connected to said receiving means and responsive to the control signal received from said sending station for controlling the operation of said hard copy generating means to generate a hard copy print of the image displayed on the display screen of said cathode ray tube.

3,864,515

WRITING MACHINE ASSEMBLY FOR PRODUCING REDUCED GRAPHIC CHARACTERS CORRESPONDING TO GROSS MOVEMENTS OF A WRITER'S ARM

James W. Fee, Jr., 16 Cottage Ave., Bay Shore, N.Y. 11706

Filed Sept. 24, 1973, Ser. No. 399,958
Int. Cl. G08c *21/00*
U.S. Cl. 178—18 **7 Claims**



1. A writing assembly comprising:

a support;

a gimbal means carried by said support having two gimbal sets rotatable respectively on mutually perpendicular horizontal axes,

an axially vertical joy stick pivotally carried by said gimbal means and having its lower end movable in all directions in a horizontal plane to outline a character;

a bias means connecting said joy stick to said gimbal means so that said joy stick is axially movable;

a first index switch means carried by said gimbal means and operable by said joy stick when the same is lifted axially; a signal pickup means operatively connected to said gimbal sets, and carried by said support so that signals are produced as said joy stick is moved;

a recorder having a recording pen movable in all directions on a table for writing characters thereon; said recorder having an electromechanical drive means for moving said pen; and having input terminal means for applying a signal to said electromechanical drive means;

a first step switch means connected to said first index switch means so that said first step switch means moves one step each time said first index switch is closed; and

a first voltage divider means connected in circuit with said first step switch means and said input terminal means of said recorder for applying said signals thereto, so that said pen is indexed one space at a time along a line of writing on said table each time said first index switch means is closed by the lifting of said joy stick.

3,864,516

FOUR-CHANNEL STEREOPHONIC SOUND REPRODUCING SYSTEM

Akio Kameoka, Kawasaki; Mamoru Kuriyagawa, Kamakura, and Shinichi Nakamura, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Mar. 7, 1973, Ser. No. 338,938
Claims priority, application Japan, Mar. 7, 1972, 47-22747
Int. Cl. H04r *5/00*
U.S. Cl. 179—1 GQ **7 Claims**

1. A four-channel stereophonic sound reproducing system for reproducing four individual audio information signals on four separate loudspeakers adapted to be arranged around a listener, said four individual audio information signals corresponding to four original signals generated from four separate microphones respectively placed at left front, right front, left rear and right rear of the listener, said four original signals being contained in encoded first and second composite signals L and R which are defined by the following equations:

$$L = (Lf+jLb)\cos\theta + (Rf+jRb)\sin\theta$$

$$R = (Rf-jRb)\cos\theta + (Lf-jLb)\sin\theta$$

where Lf=left front, Rf=right front, Lb=left rear and Rb=right rear; said sound reproducing system comprising:

first and second input terminals to which said first and second composite signals L and R are respectively applied;

a decpder matrix circuit connected to said input terminals and combining said first and second composite signals L and R to derive four reproduced signals Lf_1, Rf_1, $Lb_1$and Rb_1which are defined by the following equations:

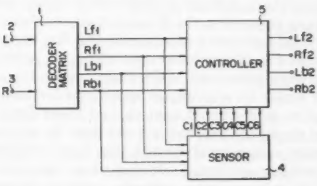
$$Lf_1 = L\cos\theta + R\sin\theta$$

$$Rf_1 = R\cos\theta + L\sin\theta$$

$$Lb_1 = L\cos\theta - \sin\theta$$

$$Rb_1 = R\cos\theta - L\sin\theta$$

a sensor circuit for producing at least one of four judgment signals C_1, C_2, $C_3$and C_4as a function of said reproduced signals Lf_1, Rf_1, $Lb_1$and Rb_1, said sensor circuit having first, second, third and fourth level detectors respectively detecting the level of said four reproduced signals Lf_1, Rf_1, $Lb_1$and Rb_1; a first mixer connected to receive the outputs of said first and third level detectors for producing a sum of the signal levels of the outputs of said first and third level detectors; a second mixer connected to receive the outputs of said third and fourth level detectors for producing a sum of the signal levels of the outputs of said third and fourth level detectors; a third mixer connected to receive the outputs of said second and fourth



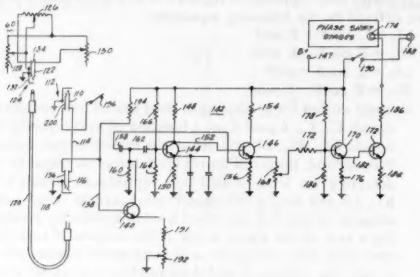
level detectors for producing a sum of the signal levels of the outputs of said second and fourth level detectors; a fourth mixer connected to receive the outputs of said first and second level detectors for producing a sum of the signal levels of the outputs of said first and second level detectors; a first level comparator having negative and positive input terminals for respectively receiving the outputs of said first and third mixers at an amplitude ratio of $1/(1+\sqrt{2})$:1 to produce said first judgment signal C_1; a second level comparator having positive and negative input terminals for respectively receiving the outputs of said first and third mixers at an amplitude ratio of $1:1/(1+\sqrt{2})$ to produce said second judgment signal C_2; a third level comparator having positive and negative input terminals for respectively receiving the outputs of said second and fourth mixers at an amplitude ratio of $1:1/(1+\sqrt{2})$ to produce said third judgment signal C_3; and a fourth level comparator having negative and positive input terminals for respectively receiving the outputs of said second and fourth mixers at an amplitude ratio of $1/(1+\sqrt{2})$:1 to produce said fourth judgment signal C_4; and

a controller circuit for controlling the respective levels of the four reproduced signals Lf_1, Rf_1, $Lb_1$and $Rb_1$from said decoder matrix circuit in response to the four judgment signals C_1 to C_4 from said sensor circuit, to provide four audio information signals Lf_2, Rf_2, Lb_2 and Rb_2 having decreased cross-talk between adjacent channels.

3,864,517
SPEED CONTROL FOR ELECTRONIC ORGAN ROTATING HORN

Dallas Richard Wilder, 715 N. Kedzie Ave., Chicago, Ill. 60612

Filed Oct. 2, 1972, Ser. No. 294,024
Int. Cl. H02p 5/34; G01h 1/02
U.S. Cl. 179—1 J 8 Claims



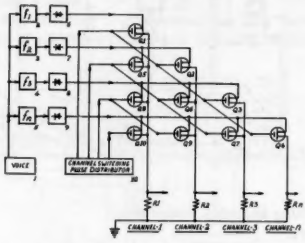
1. For use with an organ amplifier having a loudspeaker with a stationary transducer and a horn mounted at an angle relative to the axis of said transucer for rotation about the axis of said transducer, the combination comprising a single phase a.c. motor for driving said horn, a variable frequency oscillator for generating electrical a.c. power at a variable frequency, means for applying said a.c. power to said motor, and means for manually controlling the frequency of oscillation of said oscillator, said last named means including first variable resistance means for continuously controlling the speed of said motor between upper and lower limits, upper limit variable resistance means for selecting an upper limit for the frequency controlled by said manual control, and lower limit variable resistance means for selecting a lower limit for the frequency controlled by said manual control, said upper and lower limit variable resistance means selecting their respective limits substantially independently, whereby a change in one of said limits has substantially no effect on the other of said limits, and wherein said upper and lower limit variable resistance means comprises first and second variable resistors connected in parallel with each other, and a third variable resistor connected between said variable frequency oscillator and a common terminal of said first and second variable resistors, the maximum resistance of said third variable resistor being substantially lower in resistance than said first and second variable resistors.

3,864,518
SIGNAL CONVERSION APPARATUS

Meguer V. Kalfaian, 962 Hyperion Ave., Los Angeles, Calif. 90029

Continuation of Ser. No. 235,943, March 20, 1972. This application June 8, 1973, Ser. No. 368,265
Int. Cl. G10l 1/00
U.S. Cl. 179—1 SA 2 Claims

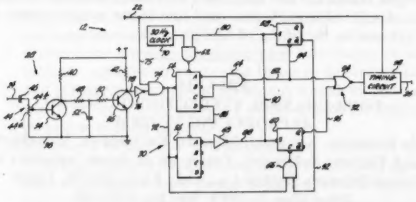
1. The system normalizing spectral variations of a group of information-bearing harmonically related frequency peak resonances in a complex sound wave by converting and standardizing the channel-location identities of said resonances, the system comprising a plurality of band-pass filters for separating the resonances of said complex wave in divisions such that the center frequency of said filters are arranged in a monotonically increasing series of frequencies; said series comprising a plurality of sub-series, all sub-series having the same number of channels such that each frequency in a sub-series is harmonically related to the same-placed frequency in the other sub-series; said filters being numbered sequentially for identity from the reference numeral one; a plurality of detectors for derivng detected signals from said band-pass filters, said detectors having numerical identities the same as the associated filters; a signal conversion switching arrangement comprising a plurality of input and output channels numbered sequentially, said switching comprising a plurality of AND-gates numerically identified from a reference numeral; first parallel connections of the first inputs of the corresponding AND-gates to corresponding input channels, second inputs of corresponding AND-gates to corresponding channel-switching control-gate inputs, third parallel connections of the outputs of corresponding AND-gates to corresponding output channels; coupling means from said detectors to corresponding first inputs of AND-gates; means for energizing said parallel-connected second inputs sequentially for said signal-switching conversion, all input channels being switched simultaneously to sequentially lower-number channels, until said group of detected signals are admitted to the output channels in an order such that the detected signal having the lowest numerical identity within the input group of signals is switched to the output channel having said reference numeral one, while the other detected signals of the input group are switched to corresponding output channels, such that the information concerning input frequency harmonic ratios is maintained relative to the input fundamental frequency, and thereby having input channels to a normalized group of output channels.



3,864,519
SPEECH-GAP-RESPONSIVE CONTROL APPARATUS

James Owen, Milwaukie, Oreg., assignor to Ford Industries, Inc., Portland, Oreg.

Filed May 11, 1973, Ser. No. 359,476
Int. Cl. H04m 1/00
U.S. Cl. 179—1 VC 4 Claims



1. Signal-monitoring control apparatus for use in combination with a telephone line and the like to verify the presence therein of a signal having certain signal gap characteristics, said apparatus comprising

an input circuit adapted to be operatively coupled to such a line to receive an electrical signal carried therein, constructed to produce an output response of one type with a signal present in the line, and an output response of another type in the absence of such a signal,

digital counting circuitry operatively connected to said input circuit operable during times that said input circuit

produces an output response of said other type to produce a count reflective of the duration of such a response, digital monitoring circuit means operatively connected to said counting circuitry for monitoring the different counts produced thereby during different output responses of said other type from said input circuit,

a resettable timing circuit having a timing cycle at the end of which it produces an output signal, and

means interconnecting said monitoring circuit means and said timing circuit for resetting said timing circuit on a recurring basis when the monitoring circuit detects, prior to the expiration of a timing cycle, recurrent counts in said counting circuitry each of which exceeds a first predetermined count but is less than a second predetermined count, whereby the production of an output signal from said timing circuit is prevented.

3,864,520

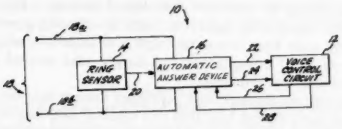
SIGNAL MONITORING CONTROL APPARATUS

James Owen, Milwaukie, Oreg., assignor to Ford Industries, Inc., Portland, Oreg.

Continuation of Ser. No. 274,856, July 25, 1972, abandoned. This application Mar. 6, 1974, Ser. No. 448,560

Int. Cl. H04m *1/64*

U.S. Cl. 179—1 VC **6 Claims**



6. Voice-signal-monitoring control apparatus usable in combination with a telephone line and the like for detecting the presence and continuity of a voice signal in such a line, where such a signal is characterized throughout its duration by a chain of successive alternating talking and nontalking intervals, with both kinds of such intervals no longer than one time span, and with the nontalking intervals no less than another time span which is shorter than said one time span, said apparatus comprising

a first resettable digital timing means for producing anoutput signal on having continuously timed for a first certain time interval equaling said one time span,

a second resettable digital timing means for producing a control signal on having continuously timed for a second certain time interval equaling said other time span,

first coupling means coupling said first and second timing means whereby a control signal produced by the latter is effective to reset the former, and

second coupling means for coupling said second timing means to a telephone line for the communication to the former of signals in the latter, whereby during each interval that a signal exists in the line the second timing means is held reset, and during each interval that a signal is absent from the line the second timing means is enabled to time.

3,864,521

FREQUENCY DIVISION MULTIPLEX TELEPHONE SYSTEM

Vincent R. DeLong, Marion; Merrill T. Ludvigson, Cedar Rapids; Frank M. Apple; John L. Leeson, both of Marion, and Edwin G. Houghton, Cedar Rapids, all of Iowa, assignors to Rockwell International Corporation, Dallas, Tex.

Filed Oct. 25, 1973, Ser. No. 409,527

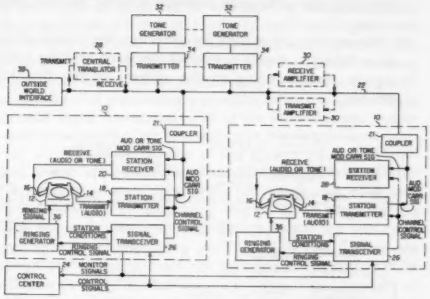
Int. Cl. H04j *1/06*

U.S. Cl. 179—2.5 R **27 Claims**

1. A frequency division multiplex telephone system for serving a plurality of telephone stations by a common cable using a plurality of telephone channels wherein each channel provides an individual communication path over the cable through a carrier signal having a unique frequency which is modulated by a signal to be transmitted, comprising:

a plurality of station transmitters, one for each station interconnecting its telephone transmitter with the cable for providing a telephone channel over which to transmit audio signals generated therein and wherein the channel so provided is determined by a channel control signal applied thereto, there being a different channel control signal for each telephone channel;

a plurality of station receivers, one for each station interconnecting its telephone receiver with the cable for providing a telephone channel over which to receive modu-



lated carrier signals wherein the channel so provided is determined by the channel control signal applied thereto;

a plurality of signal transceivers, one for each station for generating monitor signals indicative of various conditions at its associated station and for receiving and applying the channel control signals; and

a control center for monitoring and allocating the utilization of telephone channels and for generating and selectively applying to said transceivers the channel control signals in response to monitor signals received therefrom, whereby an audio communication path is established between a calling and called station via a telephone channel assigned thereto by said control center in a predetermined manner by application of the associated channel control signal to their respective transceivers.

3,864,522

AUTOMATIC TELEPHONE LOCATION SYSTEM

Raymond L. DeKozan; Edwin M. Salkeld, Jr., both of San Diego, and Elsmore W. Bush, La Jolla, all of Calif., assignors to Cubic Corporation, San Diego, Calif.

Filed Nov. 2, 1972, Ser. No. 303,109

Int. Cl. H04m *15/06*

U.S. Cl. 179—5.5 **6 Claims**

1. An automatic telephone location system for determining the location or address of telephones used in making calls to telephones at certain stations in automatic telephone systems having a plurality of telephones connected by telephone networks through a central office or the like, comprising,

a plurality of first telephones connected to a telephone network,

a second telephone located at a second station and being connected to the telephone network,

storage means at each of said first telephones for storing a coded address representing the location of the particular first telephone,

interrogating signal means at said second telephone for sending an interrogation signal to said first telephone in response to a telephone call from said first telephone to said second telephone,

detector means at said first telephone for detecting and receiving said interrogation signal and activating said storage means to send out a signal to said second tele-

phone that is coded to the address of said first telephone,

receiver means at said second telephone for receiving said address coded signal and decoding said address coded signal to identify the location of said first telephone,

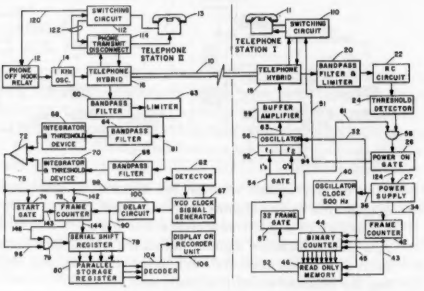
said storage means at said first telephones including a programmed memory unit,

clock signal means for interrogating said programmed memory unit,

tone generator means for generating serial two tone output signals of binary coded address information that are coded by signal outputs from said programmed memory unit,

said receiver means including a tone detector means for detecting the difference between serially received serial tones,

an address detector means for detecting the output of said tone detector means providing decoded address output signals corresponding to the address of the first telephones,



means for displaying or storing the received decoded address output signals,

said detector means including filter means for filtering a signal having the particular frequency of the interrogating signal,

threshold detector means for receiving a signal from said filter means,

said clock signal means including oscillator means for providing clock signals in response to an output signal from said threshold detector means,

said program memory unit providing a digital output signal upon being interrogated by said clock signals,

said digital output corresponding to the individual components of the address of the first telephones,

and second oscillator means for providing a first frequency for a given digital signal of said digital output and a second frequency for a second digital signal of said digital output providing said two-tone output signal of binary coded addressed information.

3,864,523
METHOD FOR TESTING A MULTIPLEX TRANSMISSION SYSTEM

Reiner Kellermann, Schaferstr. 16, 407 Rheydt, Germany

Continuation-in-part of Ser. No. 334,437, Feb. 21, 1973, abandoned. This application June 6, 1974, Ser. No. 477,312

Claims priority, application Germany, Feb. 23, 1972, 2208364

Int. Cl. H04j *3/12*

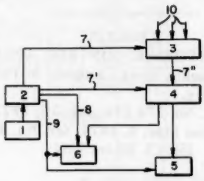
U.S. Cl. 179—15 BF **4 Claims**

1. A method for testing short circuits, line breaks, and the like, in a multiplex transmission system including a multiplexer and a demultiplexer used to transmit command signals for control of machine tools and the like, said method comprising:

A. generating a number of different square wave impulse sequences, said number of impulse sequences being at least equal to the desired number of multiplex command signals, each of said impulse sequences having at least four intervals, said first and third intervals defining first and second command intervals, respectively, and said second and fourth intervals defining first and second test intervals, respectively, said square wave impulses of each sequence being the same between their respective first and second command intervals and their first and second test intervals;

B. simultaneously transmitting each of said impulse sequences through said multiplex system;

C. transmitting through said multiplex system command signals by means of said impulse sequences during said first and second command intervals;



D. generating at least one test signal having a first and second signal level, said first signal level being generated during said first command and test intervals and said second level being generated during said second command and test intervals;

E. transmitting through said multiplex system said first test signal level during said first test interval and said second test signal level during said second test interval; and

F. comparing the transmitted test signals with said generated test signals during their respective test intervals to detect any error in the multiplex system.

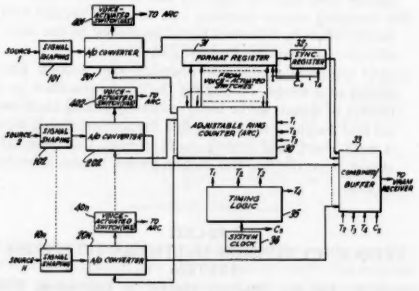
3,864,524
ASYNCHRONOUS MULTIPLEXING OF DIGITIZED SPEECH

Neil Edward Walker, Tampa, Fla., assignor to Electronic Communications, Inc., St. Petersburg, Fla.

Continuation of Ser. No. 85,671, Oct. 30, 1971, abandoned. This application Mar. 2, 1973, Ser. No. 337,663

Int. Cl. H04j *3/16*

U.S. Cl. 179—15 BA **4 Claims**



1. A variable rate speech multiplexing transmitter in which time slots occurring at a fixed predetermined rate are allocated among a constantly changing number of active speech courses comprising:

a plurality of speech sources each presenting an analog speech signal when in an active state, each source including means for shaping the analog original;

a plurality of converter means each associated with a particular speech source for converting the analog signal received therefrom to a digitally companded delta sigma modulated signal, each converter means including a companding loop and a tap connected to the loop which presents a full wave rectified signal that follows the average amplitude of the analog speech signal converted therein;

a plurality of voice actuated switch means each connected to the tap of one of the converter means to receive a signal therefrom and indicating the active or inactive state of the speech source associated with that converter means, said active or inactive state being determined with reference to a preselected threshold noise level;

a plurality of bi-stable storage latch means each connected to a particular voice actuated switch means, the storage latch means being interconnected to form a loop;

gating means for periodically supplying timing pulses to the storage latch means and thereby resetting each storage latch means to indicate the active or inactive state of the connected speech source; and

register means for combining digitized speech signals received from said converter means to form a data stream including digitized time division signals from only those converter means associated with speech sources that the storage latch means indicates are active, the register means thus providing an output in which the rate at which any active speech source is sampled varies and is dependent upon the number of other simultaneously active speech sources in the system.

3,864,525

TIME STAGE SYSTEM FOR A PCM EXCHANGE

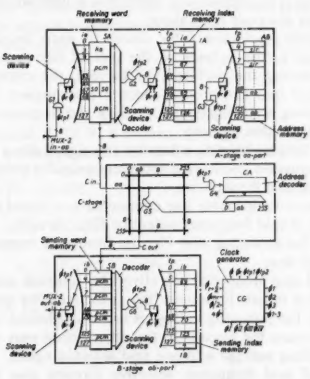
Nils Herbert Edstrom, Stockholm; Stig Gustaf Wilhelm Lindqvist, Enskede, and Gunnar Erik William Sparrendahl, Handen, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jan. 19, 1973, Ser. No. 325,057

Claims priority, application Sweden, Feb. 8, 1972, 1442/72

Int. Cl. H04q *11/04*

U.S. Cl. 179—15 AQ **2 Claims**



1. A time stage system for a PCM exchange utilizing an assemblage including a first time stage, a space stage with file contact planes and a second time stage with files connecting the first time stage to the contact planes of the space stage and further files connected the contact planes of the space stage to the second time stage wherein PCM words are received on incoming transmission links connected to the first time stage and the PCM words are transmitted on outgoing transmission links connected to the second time stage in first time slots associated with a first time division multiplex system, wherein the PCM words are transferred from the first time stage via the files and the space stage to the second time stage in second time slots associated with a second time division multiplex system, each of the PCM words being identified by a receiving and sending index and an address number allotted to the file through which the PCM words will be transferred from the first time stage to the second time stage, a clock means for the exchange including a clock generator defining the first and second time slots to have equal durations and the start of a first time slot coinciding with the start of a second time slot, the clock means also including means for generating in each of the second time slots two successive activating pulses, the exchange further including first and second scanning means connected to the clock means for performing memory scanning operations in synchronism with the first and second time division multiplex systems, respectively, said time stage system comprising a plurality of time substages, each of said time substages being connected to at least one associated incoming link and to at least one associated outgoing link of the transmission links and comprising a plurality of identical time stage units each being connected to all of the incoming and outgoing links connected to its time substage and furthermore connected to one associated file of the files going to and connected to one associated file of the files coming from the file contact plane cooperating with the time stage unit, each time substage including as many time stage units as there are file contact planes in the space stage, each time stage unit comprising at least one receiving word memory and at least one sending word memory which for writing and reading of PCM words, respectively, are connected to their respective link of the links associated with the time substage and to the first scanning means whereby PCM words are transferred between the associated links and the sending and receiving word memories under the control of said first scanning means, said receiving and sending word memories being provided with a receiving and a sending decoder means for decoding receiving and sending indices, respectively, and being connected to the outgoing and incoming file associated with the time stage unit, each time stage unit further comprising a receiving index memory and a sending index memory for storage of the receiving and sending indices, means for connecting said receiving index memory and said sending index memory to said receiving and sending decoder means, respectively, and means for connecting said second scanning means to said sending index memory and said receiving index memory whereby PCM words are transferred between the associated files and the sending and receiving memories at times indicated by the index memories under control of said second scanning means, and an address memory for storage of the address numbers allotted to the files coming from the space stage, said address memory when reading being connected to the second scanning means and to the file going to the space stage, each time stage unit furthermore comprising first blocking means connected to the clock generator for preventing, during the first of the successive activation pulses, reading from the receiving word memories and writing into the sending word memories, and for preventing, during the second of said successive activation pulses, writing into the receiving word memories and reading from the sending word memories and from the address memory.

3,864,526

TELEPHONE CALL DISTRIBUTION SYSTEM WITH TRUNK INDENTIFICATION

Robert M. Pirnie, Jr., and Robert M. Pirnie, III, both of Montgomery, Ala., assignors to Communication Equipment & Contracting Co., Inc., Union Springs, Ala.

Division of Ser. No. 227,736, Feb. 22, 1972, Pat. No. 3,780,227. This application June 28, 1973, Ser. No. 374,417

Int. Cl. H04q *3/72*

U.S. Cl. 179—27 DB **1 Claim**

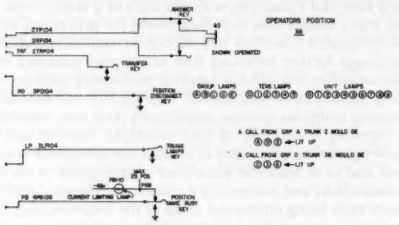
1. For use with a call answering and allotting transfer system having a plurality of incoming trunk lines at least one trunk

group, and a plurality of operator serviced position circuits and at least one position group; a trunk and position preference and selector circuit comprising:

a. electrically conductive means in circuit with said trunk lines for detecting a calling signal on a trunk,

b. means in circuit with said trunk lines for determining which of said trunk groups has an incoming calling trunk,

c. search means adapted to be conductively placed in said



position circuit to initiate search of said trunk group to locate an incoming calling trunk,

d. position trunk identifier means for indicating to the operator at an operator serviced position which of the plurality of trunks is the calling trunk, and

e. conductive means adapted to be placed in circuit with said position group to connect said operator serviced position to said incoming calling trunk.

3,864,527

INTERCOMMUNICATION SYSTEM USING CONTROLLED GATES

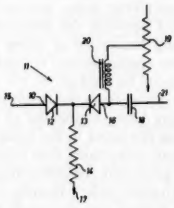
Robert Topping, Port Glasgow, Scotland, assignor to James Henry Knox, Devon, England

Filed Dec. 8, 1972, Ser. No. 313,338

Claims priority, application Great Britain, Dec. 9, 1971, 57141/71

Int. Cl. H04m *9/02*

U.S. Cl. 179—38 **13 Claims**



1. A network incorporating a plurality of three port controlled gates each comprising respective first and second unidirectionally conductive elements connected together with their conduction directions in opposition,

respective first biasing means biasing said first unidirectionally conductive elements to their conduction states, each by a different selected voltage,

a common signal line interconnecting all said second unidirectionally conductive elements,

means for applying signals to said common signal line, and adjustable second biasing means for applying a selected voltage to said common signal line, whereby signals applied to said common signal line by said signals applying means are passed by whichever of said controlled gates has a first unidirectionally conductive element biased, by the associated said first biasing means, by a voltage matching that of said selected voltage applied by said second biasing means, the remaining gates blocking said signals.

3,864,528

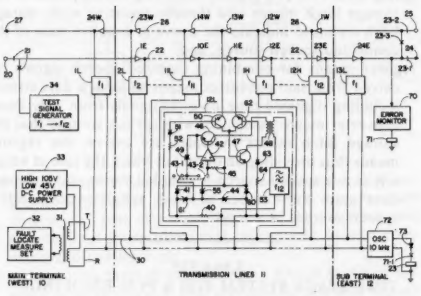
FAULT LOCATING SYSTEM FOR A DIGITAL TRANSMISSION SYSTEM

Jan Heynen, Ottawa, Ontario, Canada, assignor to Bell-Northern Research Ltd., Ottawa, Ontario, Canada

Filed Aug. 22, 1973, Ser. No. 390,426

Int. Cl. H04b *1/60, 3/46*

U.S. Cl. 179—175.31 R **3 Claims**



1. A fault locating system for a bipolar digital transmission system including first and second transmission lines having pairs of line repeaters serially connected in opposite directions at adjacent intervals therealong;

a frequency selective filter circuit at each location connected to the outputs of the pair of line repeaters for monitoring the performance thereof, the circuits being divided into two groups which are responsive to corresponding test frequencies, each of the frequencies being unique within a group;

means for transmitting a bipolar test signal along said first transmission line having recurrent unipolar pulses at one of said test frequencies;

a common fault locate line connected to a signal output of each of said frequency selective filter circuits;

means for powering said circuits from said common fault locate line;

each of said frequency selective filter circuits including a control means to actuate the circuits in one group only when the powering voltage is below a selected value and to actuate the circuits in the other group only when the powering voltage is above said selected value;

each of said frequency selective circuits also including means for selecting the output of one or the other of the pair of line repeaters connected thereto in response to the d-c polarity of the powering voltage connected to said common fault locate line;

means for detecting errors in the bipolar signal being received at the end of said first transmission line;

means for detecting the d-c powering voltage on the common fault locate line; and

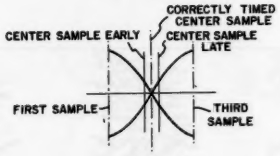
means responsive to the error detector and the voltage detector for routing the output of the first transmission line back to the input of the second transmission line.

3,864,529

RECEIVER FOR DECODING DUOBINARY SIGNALS

Robert J. Tracey, and Robert P. Lombaerde, both of San Mateo, Calif., assignors to Lynch Communication Systems, Inc., San Francisco, Calif.

Filed Sept. 14, 1972, Ser. No. 288,968
Int. Cl. H04l 7/02
U.S. Cl. 178—69.5 R 13 Claims



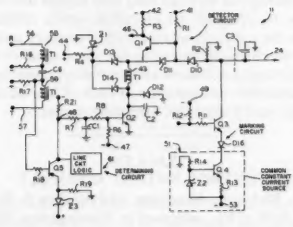
1. In a receiver for converting duobinary signals to binary data, a self-correcting clock circuit comprising:
   a. a source of duobinary signals;
   b. a source of strobe signals;
   c. comparator means connected to said signal sources so as to compare the level of said duobinary signal at the node of its "eye" pattern to a plurality of predetermined reference levels;
   d. clock means for producing clock pulses, said strobe signals having the same frequency as said clock pulses;
   e. means for varying the frequency of said clock means;
   f. binary logic means connected to said comparator means and said clock means for producing a binary timing correction output in accordance with the relation of the center sample of a sample sequence representing a $\pm 1, 0, \mp 1$ transition of the duobinary analog signal to one of said reference levels; and
   g. integrator means connected to said logic means for integrating said binary correction output over a substantial number of cycles;
   h. the output of said integrator means being connected to said clock-frequency-varying means to vary said frequency in such a manner as to shift the phase of said strobe signals to keep them centered upon the node of the duobinary "eye."

3,864,530

LINE CONTROL CIRCUIT

Alfred Hestad, 2518 N. Kilbourn, Chicago, Ill. 60639

Filed June 21, 1973, Ser. No. 372,224
Int. Cl. H04q 3/52
U.S. Cl. 179—18 GE 9 Claims



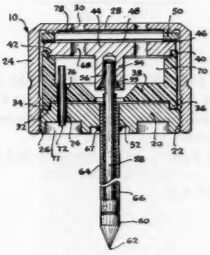
1. An improved line circuit arrangement for use in conjunction with multi-stage switching networks,
   said arrangement including a plurality of line circuits,
   at least some of said line circuits connected to a first stage switching matrix of the multi-stage switching network over a first multiple,
   at least some of said line circuits including detector means connected to said first multiple operating to determine when a path is switched through said switching network, said detector means operative when the telephone associated with a line circuit having a detector means is in the off hook or the on hook condition,
   making means operated responsive to the operation of said detector means for marking said first multiple, and
   said marking means comprising a constant current source common to a plurality of said line circuits.

3,864,531

MICROPHONE AND CONNECTOR UNIT THEREFOR

Alan Reed Watson, Niles, Mich., assignor to Electro-Voice, Incorporated, Buchanan, Mich.

Filed Oct. 29, 1973, Ser. No. 410,811
Int. Cl. H04r 1/02, 1/28, 19/04
U.S. Cl. 179—121 R 14 Claims



1. A microphone unit adapted to engage a connector unit disposed on the opposite side of a part of the clothing of a person using the microphone comprising a housing provided with a front perforated side, a back side opposite the front perforated side having an opening confronting the front perforated side, and a continuous peripheral wall acoustically sealed at the perimeter of the front side and the back side to define an inner chamber acoustically coupled to the exterior of the housing through the front perforated side, an electrically conducting plate disposed within the chamber and having a flat surface confronting the front perforated side, said plate being acoustically sealed on the peripheral wall to form a first cavity between the said surface of the plate and the front perforated side of the housing and a second cavity between the plate and the back side of the housing, a plastic diaphragm disposed in the first cavity spaced from and parallel to the flat surface of the plate, said diaphragm having an electrically conducting film on the surface thereof and carrying an electrical charge with respect to the plate, an electrical connector assembly mounted on the back side of the housing and extending through the opening thereof, said assembly having a unitary rigid elongated central pin of electrically conducting material in abutment with and electrically connected at one end on the plate and extending from the chamber of the housing to the exterior thereof, said electrical connector assembly having a rigid electrically conductive sleeve disposed about the pin and spaced therefrom, said sleeve being electrically connected to the film of the diaphragm.

3,864,532

TONE RINGER WITH A NEGATIVE IMPEDANCE AMPLIFIER

Petrie Johan Van Der Plaats, Hilversum, and Eduard Willem Van Zuuren, Emmasingel Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y

Filed Nov. 11, 1971, Ser. No. 197,855

Claims priority, application Netherlands, Nov. 24, 1970, 7017136

Int. Cl. H04m *1/26*

U.S. Cl. 179—84 T **11 Claims**

1. A device for producing acoustic power in response to ringing signals, comprising an electroacoustic converter that exhibits an impedance variation as a function of frequency and is provided with two electrical connection terminals and an acoustic resonator, a two-port amplifier having a negative impedance amplifier, a supply device for converting the ringing signals into a supply voltage for the amplifier, means directly connecting the two electrical connection terminals of the electro-acoustic converter to the two ports of said amplifier, the electro-acoustic converter being arranged so that at a given frequency there occurs a maximum magnitude of electrical impedance between the electrical connection terminals with the angle of this impedance being equal to zero.

3,864,533

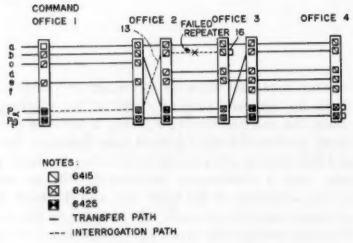
AUTOMATIC LINE TRANSFER SYSTEM AND METHOD FOR A COMMUNICATIONS SYSTEM

Anthony H. Erlund, Sunnyvale, Calif., assignor to Vidar Corporation, Mountain View, Calif.

Filed June 1, 1973, Ser. No. 365,846

Int. Cl. H04b *3/46*

U.S. Cl. 179—175.3 R **14 Claims**



1. In a communications system having a plurality of working lines each of said working lines including a plurality of spans having ends beginning and terminating at offices remote from a command office, an automatic line transfer system for automatically switching the ends of a working line corresponding to both ends of a failed span of one of said plurality of working lines to a protection line without service interruption said transfer system comprising: means for sensing a failed span of a working line; means responsive to said sensing means for switching said ends of said working line corresponding to both ends of said failed span to a corresponding span of said protection line whereby said failed span is looped around; and means for cross-connection said failed span to the preceding span of said protection line to connect said failed span to said command office.

3,864,534

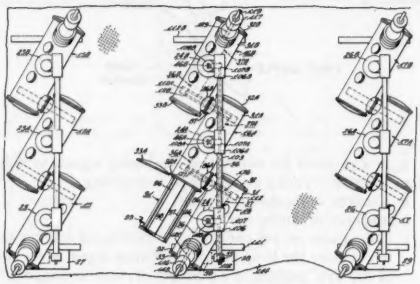
MODULAR GAS INSULATED CIRCUIT BREAKER SYSTEM

Edwin C. Goodwin, Jr., Canton; Lynne A. Holden, Jamaica Plain, and Gerardus J. Meinders, Norfolk, all of Mass., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed July 18, 1973, Ser. No. 380,249

Int. Cl. H01h *33/54*

U.S. Cl. 200—148 R **6 Claims**



1. In a modular substation;

a plurality of gas insulated circuit breaker units arranged in axial parallelism wherein each circuit breaker unit includes;

an enclosure containing an insulating gas at a first pressure; a pair of series connected contacts;

a separate tank carried by said enclosure exteriorly thereof and containing an insulating gas at a relatively higher second pressure;

blast valve means carried by said enclosure and operatively arranged to interconnect said high pressure gas tank to the interior of said enclosure;

contact and blast valve actuating means carried by said enclosure and operably connected to be operated simultaneously to effect substantially simultaneous opening of said contacts and said blast valve means;

port means operatively interconnecting said enclosures of said circuit breaker units in communicating relationship to provide an electrical passageway between adjacent enclosures;

sealing means within said interconnecting means to isolate one circuit breaker unit from another to maintain the gas tight integrity of each enclosure;

means extending between said circuit breaker units within said enclosures through said port means and said sealing means to establish an electrical series relationship between the contacts of said circuit breaker units; and,

a single mechanical operating means external of said circuit breaker unit enclosures and operably connected to effect the simultaneous operation of each of said circuit breaker contact and blast valve actuating means.

3,864,535

CONTROL SWITCH ASSEMBLY

Edward L. Richards, Aliquippa, and Stephen S. Dobrosielski, Beaver, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

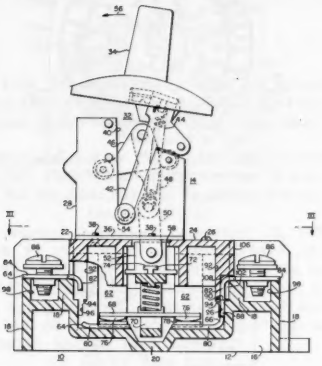
Filed Oct. 26, 1973, Ser. No. 410,154

Int. Cl. H01h *9/08*

U.S. Cl. 200—281 **12 Claims**

1. A switch device comprising an electrically insulating housing having housing walls forming a chamber, a cover detachably mounted on the housing, at least one set of

contacts within the housing and comprising stationary contacts and movable contacts movable between open and closed positions with the stationary contacts, means for moving the movable contacts, the stationary contacts for each set of contacts comprising contact structure having a contact portion, an intermediate portion, and a terminal portion, the cover and housing having mutually interfitting portions for clampingly retaining the stationary contacts in place within



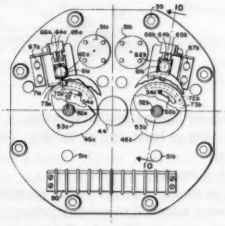
the chamber when the cover is in place on the housing, the stationary contacts being removable from the chamber when the cover is detached, the cover and housing forming an access opening through which the terminal portion extends, the mutually interfitting portions comprise a projection on the cover extending in the direction of insertion of the cover onto the housing, and the projection being in surface-to-surface contact with the intermediate portion of the stationary contacts.

3,864,536

COAXIAL TRANSFER SWITCH

Thomas J. Vaughan, 201 Ray St., Manchester, N.H. 03104, and Richard A. Hickey, 622 Prescott St., Manchester, N.H. 03103

Filed Nov. 16, 1972, Ser. No. 307,193
Int. Cl. H01h *43/00*
U.S. Cl. 200—37 A **10 Claims**



1. In a multi-port coaxial power switch having a rotor for interconnecting ports, means for actuating the rotor comprising,

a first electrical drive for driving the coaxial switch from a second position to a first position,

first drive means from the first electrical drive to the rotor, said first drive means including a first cam and a first gear directly driving the rotor and first means inter-connecting the first cam and first gear,

a second electrical drive for driving the coaxial switch rotor in the opposite direction from the first position to the second position,

second drive means from the second electrical drive to the rotor,

switching means for coupling electrical power from a source to the first and second electrical drives,

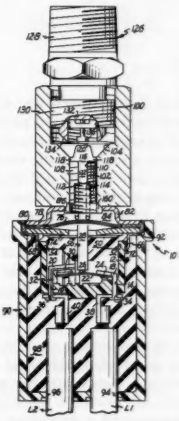
whereby the first and second electrical drives are energized at different first and second intervals to position the switch at the first and second positions, respectively.

3,864,537

PRESSURE RESPONSIVE APPARATUS INCLUDING VALVE ACTUATING MEANS

Peter O. Fiore, Cumberland, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 16, 1973, Ser. No. 351,751
Int. Cl. H01h *35/34*
U.S. Cl. 200—83 S **6 Claims**



1. In combination with a pressure responsive switch having a housing and a pressure responsive diaphragm mounted in the housing and movable from a first configuration to a second opposite configuration the motion from the diaphragm transmitted to a movable electric contact which is adapted to move into and out of engagement with a stationary contact upon movement of the diaphragm from one configuration to the opposite configuration and a port fitting for reception of pressure to a surface of the diaphragm, the port fitting provided with a threaded bore, a bored adjustive screw disposed in the threaded bore and a spring extending from the screw to the pressure responsive diaphragm whereby the bias of the spring can be adjusted by movement of the adjusting screw, a coupling containing an axially actuatable valve and on which the port fitting is mounted, the improvement which comprises an actuating element positioned in the port fitting in alignment with the axially actuatable valve whereby the valve is actuated upon mounting of the port fitting on the coupling, the actuator element being formed of material having a first hardness and the port fitting is formed of material having a second hardness softer than the said first hardness and the element is pressed into and cuts threads of the threaded bore of the port fitting to lock it in place, the actuator element having a stem depending therefrom, the stem extends into the bore of the adjusting screw and fits loosely enough to permit relative movement between screw and stem and tightly enough to prevent any tendency of the actuating element to twist.

3,864,538

FLOAT TYPE LIQUID LEVEL SWITCH

Arthur George Paradis, and Guy B. Paradis, both of Box 96, Dunrea, Manitoba, Canada

Filed May 4, 1973, Ser. No. 357,398
Claims priority, application Canada, May 18, 1972, 142635
Int. Cl. H01h *35/18*
U.S. Cl. 200—84 B **1 Claim**

1. In a liquid level float assembly which includes a supporting electrical conductor and means adjacent to but spaced from the lower end of said conductor to maintain said conductor relatively vertical; a sealed plastic shell, a screw threaded stem extending from one end of said shell, gland nut means screw threadably engageable around said conductor and said screw threaded stem to sealably secure said shell to the lower end of said conductor with said lower end entering said shell, means controlled by the attitude of said shell to make and break electrical connections within said lower end of said cable, said last means including a tube capable of adopting a switched closed attitude and a switched open attitude, switch contacts in one end of said tube being operatively connected to said lower end of said cable a quantity of mercury within said tube sufficient to envelop said switch contacts when said tube is in the switched closed attitude and means pivotally mounting said tube intermediate the ends thereof whereby said tube can pivot around a transverse axis thereof to said switched closed and to said switched open position, said means pivotally mounting tube including a pair of upwardly extending spaced and parallel supports secured to the base of said shell, a support clip surrounding said tube centrally thereof, means to pivot said support clip to said supports for tilting action, and shock absorber means on said base to receive the ends of said tube when same tilts from one position to the other and vice versa.

3,864,539

DAY AND HOUR CONTINUOUSLY CYCLING TIMING CONTROLLER WITH ADJUSTABLE CAM ACTUATORS

Fred Hauser, 1544 Midvale, Los Angeles, Calif. 90024

Filed Feb. 19, 1974, Ser. No. 443,380
Int. Cl. H01h *43/20*
U.S. Cl. 200—38 DA **15 Claims**

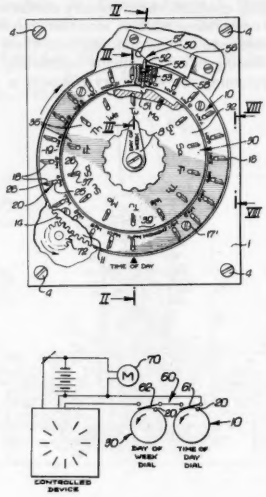
1. A day and hour timer apparatus for activating a controlled device at selectable times over a period of days comprising:

a. an hour timer having a plurality of locations corresponding to hours of the day and adjustable switch actuating means at each location on said hour timer;

b. a day timer having a plurality of locations corresponding to days of the week and adjustable switch actuating means at each location on said day timer;

c. mounting means for mounting said hour timer and said day timer concentrically and for concentric rotation under urging of an associated drive means; and

d. switch means and means for positioning said switch



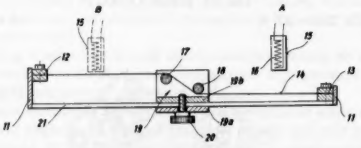
means in association with said timers for actuation by said switch actuating means.

3,864,540

CONTROL ARRANGEMENT FOR ACTUATING A SWITCHING CONTACT ON A MOVABLE MACHINE PART

Wilhelm Saumer, Emmerdingen, Germany, assignor to Kloeckner-Ferromatik GmbH, Malterdingen, Germany

Filed Nov. 17, 1971, Ser. No. 199,594
Claims priority, application Germany, Nov. 21, 1970, 2057277
Int. Cl. H01l *36/00*
U.S. Cl. 200—153 R **1 Claim**



1. In a machine having movable parts, a control arrangement for actuating at least one switching contact, comprising in combination,

an actuating member;

a switching contact, said actuating member and switching contact being adapted to move relative to each other, said movement corresponding to the movement of a part of said machine;

a flexible flat band operatively mounted in said actuating member;

said switching contact being adapted to be actuated by said flat band when said switching contact has reached a predetermined first position relative to said flexible flat band and being adapted to be de-actuated when said switching contact has moved from said first position to a predetermined second portion relative to said flat band;

means operatively connected to said flat band for adjust-

ing the position of said flat band relative to said switching contact; and

a shaft rotatably mounted in said actuating member and being biased to rotate in one direction, one end of said flexible flat band being secured to said shaft and the other end of said flat band being secured to said adjusting means, said adjusting means being adjustably movably mounted longitudinally with respect to said flat band on said actuating member.

3,864,541

SYSTEM FOR THE CONTROLLING OF AN APPARATUS FOR THE ELECTRIC DISCHARGE MACHINING ETC.

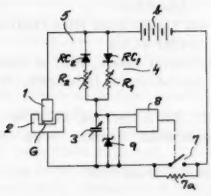
Kiyoshi Inoue, 16-8, 3-chome, Kamiyoga, Setagayaku, Tokyo, Japan

Continuation-in-part of Ser. No. 272,463, July 17, 1972, Pat. No. 3,781,507, which is a division of Ser. No. 19,364, March 13, 1970, Pat. No. 3,686,461. This application Oct. 23, 1973, Ser. No. 408,382

Claims priority, application Japan, Feb. 20, 1973, 48-20341; Feb. 21, 1973, 48-21015; Mar. 3, 1973, 48-25832; May 17, 1973, 48-55019; July 26, 1973, 48-83586; Sept. 12, 1973, 48-102208; Mar. 13, 1969, 44-18991; Apr. 2, 1969, 44-25317; Apr. 2, 1969, 44-25318; Apr. 30, 1969, 44-33960; May 30, 1969, 44-42188; Nov. 1, 1969, 44-87832; Nov. 26, 1969, 44-94741; Nov. 26, 1969, 44-94742

Int. Cl. B23p *1/08*

U.S. Cl. 219—69 C **12 Claims**



1. In an electric discharge machining apparatus in which a tool electrode is spacedly juxtaposed with a workpiece electrode across a dielectric-swept gap, the improvement which comprises:

a source of machining current connected to said electrodes;

on-off switch means in circuit with said source and said electrodes and adapted to be rendered conductive and nonconductive selectively by a gating signal to apply a voltage pulse to said gap, thereby effecting an electrical discharge between said electrodes;

means for deriving an analog signal representing the current traversing said gap;

converter circuit means for transforming said analog signal into a train of digital pulses of a frequency proportional to said analog signal;

a counter for counting said digital pulses and producing an output signal upon the number of digital pulses detected by said counter attaining a predetermined number; and

a gate circuit connected to said counter and operated by said signal for terminating said gating signal to said switch means to terminate the discharge.

3,864,542

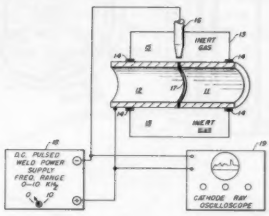
GRAIN REFINEMENT CONTROL IN TIG ARC WELDING

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention by; William F. Iceland, 11711 Reagan St., Los Alamitos, Calif. 90720 and Edwin L. Whiffen, 1019 Verona Dr., Fullerton, Calif. 92635

Filed Nov. 13, 1973, Ser. No. 415,486

Int. Cl. B23k *9/00*

U.S. Cl. 219—137 **5 Claims**



1. A method for controlling grain size and weld puddle agitation in an inert gas atmosphere welding operation, comprising the steps of:

supplying DC voltage pulses between a welding electrode and a pair of members to be welded in the presence of an inert gas atmosphere, said DC voltage pulses being of equal time duration;

sensing the voltage in the electric arc formed in said inert gas between said electrode and said member being welded;

varying the operating frequency of said DC voltage pulses from a lower frequency to a higher frequency over a preselected frequency range;

selecting the frequency in said preselected frequency range which produces a maximum value of said sensed arc gas voltage; and

maintaining the operating frequency at said selected frequency producing said maximum value of arc gas voltage to thereby produce maximum weld puddle agitation and fine, uniform grain size in the weld zone.

3,864,543

CONTINUOUSLY MODULATED ELECTRODE BOILER

Glenn R. Mohr, Linthicum, Md., assignor to Mohr-Baker Co., West Chicago, Ill.

Filed May 29, 1973, Ser. No. 364,679

Int. Cl. H05b *3/60, 1/02*

U.S. Cl. 219—285 **11 Claims**

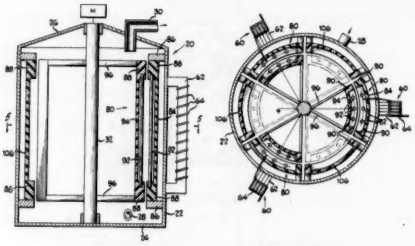
1. An electrode boiler comprising:

A. An electrically conductive container means;

B. A pair of relatively movable electrodes within said container means for creating a current path through a fluid within said container means;

C. A variable reactance adapted to be connected to a power

source and in series with the movable electrodes, said reactance being mounted upon said container and including an inductance means for passing flux through the container means to induce a current therein.



3,864,544

ELECTRIC HEATING UNIT FOR LIQUID

Edward van Amerongen, Wilmette, Ill., assignor to Respiratory Care, Inc., Arlington Heights, Ill.

Filed Sept. 13, 1973, Ser. No. 396,782

Int. Cl. H05b *1/02*; **B67d** *5/62*

U.S. Cl. 219—301 **10 Claims**

1. An electric heating unit for heating a rising column of liquid adapted to be screwed onto a liquid receptacle having an upwardly facing threaded portion adapted to receive the unit, the receptacle being closed at said threaded portion by a breachable membrane, and adapted to be screwed onto a nebulizer having a downwardly facing threaded portion adapted to receive the unit, so that the unit can be functionally disposed between the receptacle and the nebulizer, comprising:

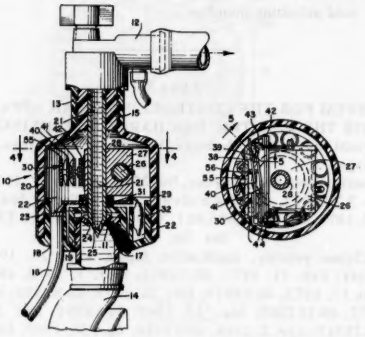
a housing having an upwardly facing threaded portion which can be mated with the threaded portion of said nebulizer, and a downwardly facing threaded socket whereby the unit can be screwed onto the threaded portion of said receptacle, said socket having concentrically a tubular apertured breaching means adapted at one end to extend into the threaded portion of the receptacle when the unit is screwed thereon to breach said membrane;

a tubular member within said housing having one and in fluid communication with the other end of said tubular means and the other end disposed concentrically within the upward facing threaded portion of said housing;

an electric heater disposed in heat exchange relationship to the tubular member;

a thermostat disposed adjacent said heater and electrically connected to control said heater; and

an electric power cord passing into said housing through a hole therein and connected to the heater and the thermostat.



3,864,545

APPARATUS AND METHOD FOR HEATING SOLID SURFACES

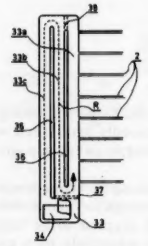
Wolfgang Schafer, and Helmut Brook, both of Aachen, Germany, assignors to Saint-Gobain Industries, Neuilly sur Siene, France

Filed Sept. 27, 1972, Ser. No. 292,770

Claims priority, application France, Sept. 30, 1971, 71.35161

Int. Cl. B60l *1/02*

U.S. Cl. 219—203 **6 Claims**



1. A window comprising a transparent sheet, a plurality of opaque resistive conductors substantially coextensive in length adhered in spaced substantially parallel relation to a surface of the sheet, said conductors having a width small compared to their spacing, at least two bus bands made of electrically conductive material and having a width wider than said conductors, said bus bands adhered to said surface of the sheet and connecting said conductors electrically in parallel, a current terminal connecting to each of said bus bands, and at least one of said bus bands having elongated aperture means therethrough extending lengthwise of said bus band with an end of said aperture means close to said terminal, said conduc-

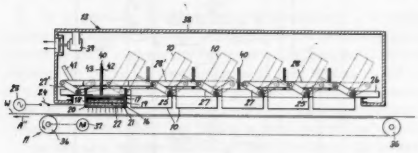
tive material being removable selectively from said sheet whereby upon said selective removal over a path extending from said aperture means to the outer periphery of said at least one bus band the current path between the current terminal connecting to said at least one bus band and said conductors will be increased in length.

3,864,546

SYSTEM FOR IRRADIATING A DISCONTINUOUSLY MOVING WEB

Hugo N. Cahnman, Kew Gardens, N.Y.; Frank Sterne, Wyckoff, N.J., and Douglas M. Canfield, White Plains, N.Y., assignors to Casso-Solar, Kew Gardens, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,530
Int. Cl. H05b *3/20*
U.S. Cl. 219—354 **2 Claims**



1. An apparatus for radiantly treating a discontinuously displaced web, said apparatus comprising:

a plurality of panels each having a radiation-emitting surface normally directed at said web at a location and pivoted about a respective axis;

means for detecting displacement of said web past said location;

means connected between said detecting means and said panels for pivoting each of said panels about said axis and directing said surface away from said web upon detection of an interruption in displacement of said web, said pivoting means being operatively connected to all of said panels; and

respective shields each displaceable into a position between a respective radiation-emitting surface and said web in the position of said panels wherein the surfaces are directed away from said web, at least one of said shields extending from the back of one of said panels generally perpendicularly thereto and being engageable with the panel immediately adjacent thereto when said panels are directed away from said web.

3,864,547

SAFETY PORTABLE RADIANT TYPE ELECTRICAL HEATER

Jimmy C. Ray, Denison, Tex., assignor to Industrial Innovations, Inc., Denison, Tex.

Continuation-in-part of Ser. No. 239,692, March 30, 1972, Pat. No. 3,792,230. This application Sept. 21, 1973, Ser. No. 399,607
Int. Cl. H05b *1/02;* **F21v** *29/00;* **H05b** *3/00*
U.S. Cl. 219—343 **2 Claims**

1. In a soldering device having

a. a base,

b. a lamp attached to the base,

c. a reflector surrounding the lamp for focusing the heat rays emitted therefrom, and

d. a power source of electricity for the lamp connectable thereto,

e. The improved Structure for cooling the lamp and reflector and for purging the work comprising:

f. a shroud having

i. a circular cross section with

ii. an axis extending along the focal axis of the reflector,

g. a base plate to which the base is attached in the shroud,

gg. said shroud

i. surrounding said base, lamp, and reflector,

ii. spaced from the reflector to form an annular area therebetween, and

iii. having an open front through which the heat rays are projected by the reflector,

h. a block in the rear end of the shroud, including means cooperating with the base plate to form

j. a plenum between the base plate and block,

k. tube means for supplying pressurized gas to the plenum,

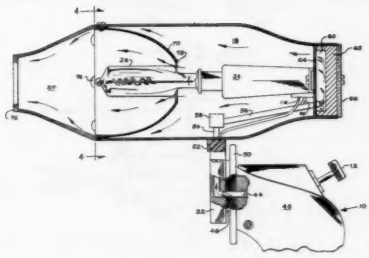
m. perforations through the base plate to pass gas from the plenum around the base and into the space between the reflector and the shroud,

n. an opening in the reflector around the lamp to pass gas around the lamp,

o. a nozzle attached to the front of the shroud,

p. tuyeres between the shroud and the reflector at the nozzle attachment to pass gas from the annular area outside the reflector into the nozzle,

q. said nozzle having an outlet through which said gas and said heat rays are emitted,



r. the cross sectional area of the attachment of the nozzle to the shroud being at least four times greater than the cross sectional area of the outlet of the nozzle,

s. said nozzle also functioning to protect the bulb from breakage,

t. a switch means responsive to the flow of gas to the plenum for connecting the power source to the lamp,

u. a flow path for gas connected to said tube means,

v. a movable magnet in the flow path, wherein

w. said switch means is magnetically actuated responsive to the position of said magnet, and

x. a pistol-grip handle having

i. an index finger bight,

ii. a forward portion where the fingers encircle the grip, and

iii. a back where the palm contacts the grip,

y. said pistol-grip handle attached to the shroud,

z. the entire device having a center of gravity,

aa. the center of gravity located between lines extended from the forward portion of the grip and the back of the grip.

3,864,548

MACHINE FOR READING ARTICLE CARRING CODED INDICIA

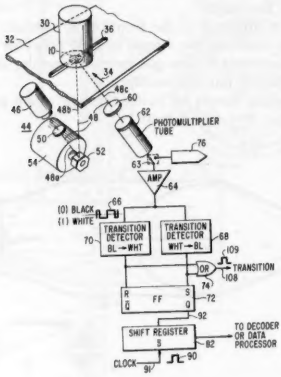
John Tettemer O'Neil, Jr., Princeton; Angelo Pelios, Somerville; Allen Henry Simon, Hightstown, all of N.J., and Frank George Nickl, Morthboro, Mass., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 27, 1973, Ser. No. 345,322
Int. Cl. G06k *7/10;* **G08c** *9/06*
U.S. Cl. 235—61.11 E **9 Claims**

1. Apparatus for reading a label of the type having binary information exhibiting two contrasting characteristics presented serially along a reference line, the label having a start section and a data section, the start section comprising a

plurality, X, of said two contrasting characteristics in an alternating pattern, each characteristic being of a given unit width U, the data section comprising a plurality of said characteristics in an alternating pattern, each of said plurality of characteristics of said data section being of any multiple from one through N of unit width U, where N is an integer greater than two, comprising in combination:

means for scanning said label along said reference line, at a rate which may vary as the scan progresses, for producing a scan signal corresponding to the characteristic pattern being scanned, the scan passing first over said start section than over said data section;



means responsive to the transitions in said scan signal while scanning said start section for determining and storing a signal indicative of the average time to scan a unit width U;

means responsive to said scan signal while scanning said data section and to said signal indicating the average time to scan a unit width U for determining the number of unit widths of a characteristic being scanned; and

means responsive to a transition from one characteristic to the other in the data section, and to the number of unit widths most recently scanned for modifying the signal indicative of the time to scan one unit width.

3,864,549

N-POSITION SCANNER HAVING PLURAL SEQUENTIALLY ENABLED DECODERS

Michael Joseph Yaccino, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 7, 1973, Ser. No. 422,955

Int. Cl. G06r *7/00*

U.S. Cl. 235—61.11 R **10 Claims**

1. A multiple position scanning circuit comprising:

first and second interconnected binary counters, each binary counter having a plurality of stages;

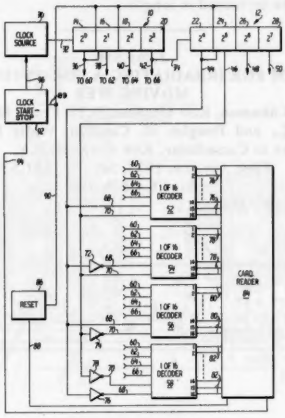
counter stage output means coupled to each of said plurality of stages for providing output signals representative of the state of each said stage,

a source of clock signals coupled to said binary counters for permitting said counters,

a plurality of 1-of-*n* decoders coupled to said binary counters, each having a plurality of decoding inputs, a plurality of enabling inputs and a plurality of scanning outputs,

first circuit means coupled between said counter stage output means of said first binary counter and said decoding inputs of each of said decoders for applying said signals representative of the state of each counter stage to said decoders; and,

second circuit means coupled between at least one of said counter stage output means of said second binary counter and said enabling inputs of each of said decoders for sequentially enabling said plurality of decoders,



whereby said scanning outputs of said plurality of decoders are sequentially scanned as said clock signals are applied to said binary counters.

3,864,550

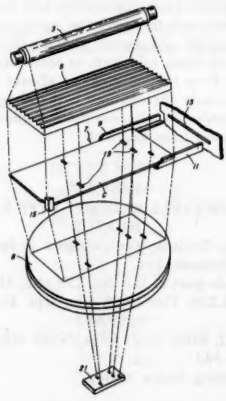
CHARGE COUPLED DEVICE

Harvey George Cragon, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 27, 1974, Ser. No. 446,172

Int. Cl. G06k *7/10;* **G11c** *11/34, 11/42*

U.S. Cl. 235—61.11 E **4 Claims**



1. A reader for reading information stored in cards by means of holes formed therein, which comprises:

a. means for holding punched cards with predetermined alignment, said cards having locations thereon in which holes have been formed in a predetermined patter;

b. a charge coupled imager having a plurality of frames; and

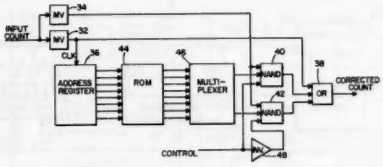
c. means for directing light through said holes in the punched card and for focussing said light on corresponding frames of said charge coupled imager;

d. said frames of the charged coupled imager having a total area greater than the focussed area of the punched card.

3,864,551
COINCIDENCE CORRECTION CIRCUIT

Arthur Oefinger, Stratford, Conn., assignor to General Science Corp., Bridgeport, Conn.

Filed Mar. 1, 1974, Ser. No. 447,530
Int. Cl. G06m *11/00*; **H03k** *21/34*
U.S. Cl. 235—92 PC **11 Claims**



1. In a particle counting system including a transducer having an aperture through which particle-containing liquid is caused to flow and means for generating electrical pulses in response to particles passing through said aperture, circuitry for providing correction for the coincident passage of multiple particles through said aperture, said circuitry comprising:

means for providing first pulses in response to said electrical pulses and representative of measured particle count;

means for providing second pulses in response to said electrical pulses;

memory means containing data representing predetermined particle counts at which correction is to occur;

address means operative in response to said first pulses to address said memory means to cause the provision of parallel output codes therefrom;

multiplexer means operative in response to said parallel output codes to provide at least one gating signal;

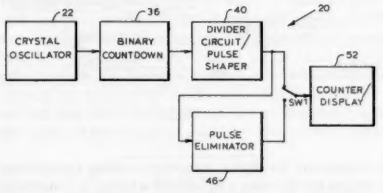
first gate means operative in response to said at least one gating signal and to said second pulses to provide a correction pulse; and

second gate means operative in response to said first pulses and said correction pulse to provide output pulses representative of a corrected particle count.

3,864,552
SPEEDCLOCK

Melvin Richard Phillips, P.O. Box 5334, Titusville, Fla. 32780

Filed Mar. 15, 1973, Ser. No. 341,329
Int. Cl. H03k *21/16*
U.S. Cl. 235—92 T **5 Claims**



1. An odometer and speedclock combination comprising:

an odometer for measuring an actual distance of travel;

means for generating a repetitive train of electric pulses;

means coupled to said generating means for counting a given number of said pulses during successive incremental time periods, said number of pulses during each incremental time period being preselected to represent a predetermined increase in a distance equal to a constant speed rate multiplied by the sum of said incremental time periods;

means positioned adjacent said odometer and coupled to the output of said counting means for displaying a count of said pulses as a desired distance of travel;

a pulse eliminating circuit for selectively eliminating a number of input pulses per cycle of input pulses into said counting means;

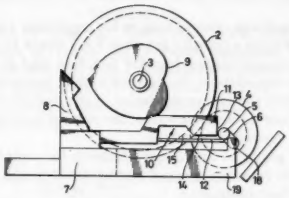
said input pulses into said counting means being proportional to an increase in a distance equal to a constant speed rate multiplied by the sum of said incremental time periods; and wherein

said odometer and said display means are positioned such that said desired distance of travel can be readily compared to said actual distance measured by said odometer.

3,864,553
RESETTING DEVICE FOR COUNTER DRUMS

Hans Gunter Krauss, Vohrum, Germany, assignor to Elmeg Elektro-Mechanik GmbH, Peine, Germany

Continuation of Ser. No. 325,428, Jan. 22, 1973, abandoned. This application Apr. 1, 1974, Ser. No. 456,538
Claims priority, application Germany, Jan. 24, 1972, 2203250
Int. Cl. G06c *15/42*
U.S. Cl. 235—144 HC **10 Claims**



1. In a reset device for resetting the digit drums of a counter wherein the digit drums are couplable by transfer pinions carried on a common shaft, which is movable to disconnect the transfer pinions from digit drums during the return movement of the digit drums the device having means for resetting the digit drums upon advance of a reset slide and holding the digit drums in the reset position unitl the reset slide is being retracted, the improvement of a control member connected to the reset slide and having a particularly contoured cam surface, in which the pinion shaft is engaged for displacement of the pinion shaft, the cam surface of the control member having a first cam surface aligned, so that, in a first phase of actuation and advance of the reset slide, the pinion shaft is engaged therein and the transfer pinions are moved out of engagement with the digit drums; a second cam surface continuing the first cam surface but in a different direction, so that, in a second phase of continued and advance actuation of the reset slide, the pinion shaft as engaged therewith causing the out-of-engagement position of the transfer pinions to be maintained, so that the digit drums can be reset by the means for resetting while remaining disengaged from the transfer pinions; and a third cam surface continuing the second surface, again in a different direction, so that in a final phase of the still continued actuation and advance of the reset slide the pinion shaft as engaged therewith is displaced, so that the transfer pinions are moved back and into engagement with the digit drums, while the reset position of the digit drums is actively maintained by the means for resetting, said member and said shaft constructed for relative displacement transverse to the movement of the shaft by operation of the first and third cam surfaces, so that as said reset slide is being moved back to its starting position, the third and second cam surface bypass said pinion shaft and the reset position of the digit drums is not being altered as the reset slide moves back.

3,864,554
TIME DELAY COMPENSATION IN A CLOSED-LOOP PROCESS CONTROL SYSTEM

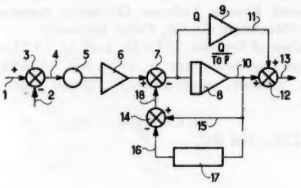
Gabriel Chevalier, Grenoble, and Roland Rouxel, Biviers, both of France, assignors to Societe Generale De Constructions Electriques et Mecaniques (Alsthom), Cedex, France

Continuation-in-part of Ser. No. 211,803, Dec. 23, 1971, Pat. No. 3,790,764. This application Nov. 27, 1972, Ser. No. 309,883

Claims priority, application France, Nov. 29, 1971, 71.42791

Int. Cl. G05f *11/01*

U.S. Cl. 235—150.1 **2 Claims**



1. A feedback control system for regulating a time-retarded process having a transfer function F×G where G represents an equivalent unretarded transfer function and F represents a factor of retardation, the control system input being coupled to a control signal representative of the deviation of a process output from a reference value, the control system comprising: first and second subtracters;

a first group of first linear elements for coupling the error signal from the control system input to the first input of the first subtracter;

a second group of elements including an integrating element and a second linear element, an adder having first and second inputs and an output constituting the output of the control system, first means for connecting the output of the second linear element to the first input of the adder, and second means for connecting the output of the integrating element to the second input of the adder;

third means for connecting the output of the first subtracter to the inputs of the integrating element and the second linear element;

fourth means for connecting the output of the integrating element to the first input of the second subtractor;

a retarding circuit having a transfer function equal to F and coupled between the output of the integrating element and the second input of the second subtractor; and

fifth means for connecting the output of the second subtractor to the second input of the first subtractor.

3,864,555
BEARING DISPLAY DEVICE FOR A PLURALITY OF TARGETS

Francis R. Brinker; Eugene R. Roeschlein, and David L. Zeph; all of Indianapolis, Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 27, 1973, Ser. No. 419,311

Int. Cl. G06f *15/50*

U.S. Cl. 235—150.2 **5 Claims**

1. A device for displaying positions of a plurality of targets detected by a sonar system relative to a craft comprising,

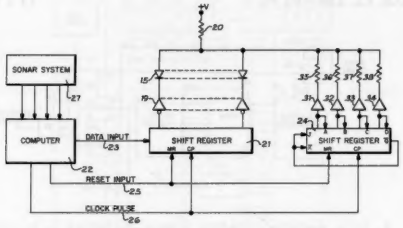
a stationary housing,

a dial rotatably attached to said stationary housing for indicating direction of travel of a craft,

a plurality of lighting elements positioned around a circumference on said stationary housing for indicating positions of targets,

means for individually energizing said lighting elements,

computing means for periodically updating the selection of said lighting elements to be energized, and



means for keeping a constant current flow through each said lighting element that is energized when different numbers of lighting elements are energized.

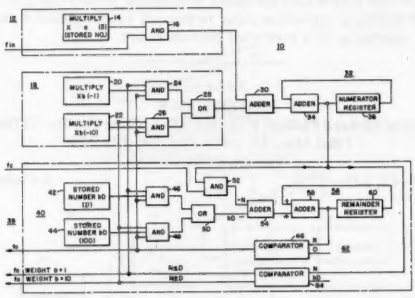
3,864,556
APPARATUS FOR DIGITAL FREQUENCY SCALING

Francis A. Fluet, Clarence, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 31, 1973, Ser. No. 411,543

Int. Cl. G01r *23/02*

U.S. Cl. 235—150.3 **7 Claims**



1. Apparatus for digital frequency scaling comprising:

a. means for deriving a signal *afin* where *a* is a multiplication factor which may be an integer or a fraction, and *fin* is an input pulse train;

b. means for deriving a weighted scale signal *bfo* where *b* is a scale number 1,2,3,4 ...*m*, and *fo* is the output frequency of said apparatus;

c. means for integrating the signals *afin* – *bfo* to derive a signal *N;*

d. means for deriving a signal *bD* where *D* is a preselected stored number;

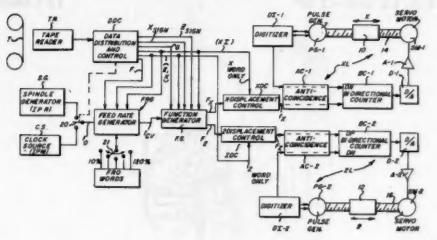
e. means enabled by a clock pulse signal *fc* for integrating the signals *bD–N* to derive a signal *R;* and

f. means for comparing *N* with *bD* and *R* with 0, for selecting the smallest scale number *b* such that *N*<*bD* and for delivering output signal *fo* when *R*<0.

3,864,557
INTERPOLATOR FOR MACHINE TOOL CONTROL

Emmett F. Sindelar, Moreland Hills, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Aug. 29, 1973, Ser. No. 392,684
Int. Cl. G06f *15/46*
U.S. Cl. 235—151.11 **21 Claims**



1. A control for use in controlling movement of a machine tool comprising:

a source of pulses having a first pulse rate,

feed rate generator means including first pulse rate multiplying means having a plurality of states for modifying the pulse rate of pulses derived from said pulse source in accordance with a multiplier having a value M/N, where N is of a fixed value corresponding with the maximum number of states of said multiplying means and M is a first modifying signal having a value depending upon a function of the values of first, second, and third signals, means for receiving a said first, second, and third signal and deriving as said functions thereof the normalized value of each of said signals, and means for developing from said normalized first, second, and third signals a said first modifying signal M; and

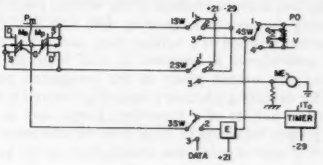
function generator means including second and third pulse rate multiplying means for each receiving the said modified output pulses from said feed rate generator means and multiplying the pulse rate thereof by a multiplier M'/N' wherein M' for said second rate multiplier is a second modifying signal having a value corresponding with said first signal and M' for said third rate multiplier is a third modifying signal having a value corresponding with said second signal, and wherein N' is variable having a maximum value of the same amount for each of said second and third rate multiplier means corresponding with the maximum number of states of each of said second and third rate multiplier means, said second and third rate multipliers having means for respectively receiving said first signal and said second signal, and means for effectively normalizing said first and second signals by varying the value of N' by the same extent in each of said second and third multiplier means in dependence upon the value of the larger of said first and second signals.

3,864,558
ARITHMETIC COMPUTATION OF FUNCTIONS

Karl Ka-Chung Yu, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 14, 1973, Ser. No. 360,256
Int. Cl. G06g *7/20*
U.S. Cl. 235—193 **15 Claims**

1. Apparatus for determining the square of difference between a first magnitude and a second magnitude including an n-channel MINSTOR and a p-channel MINSTOR, each MINSTOR having a substrate, a source, a drain and a gate, means connecting in a network the source and drain of one of said MINSTORS in anti-parallel with the source and drain of the other MINSTOR, means, connected to said network, for impressing a voltage between the sources and drains of said MINSTORS, means for connecting one of said gates to the other of said gates, means for applying polarizing voltage between the gates and substrates of said MINSTORS to impress a threshold voltage, which measures said first magnitude, between the gates and the substrates of said MINS-

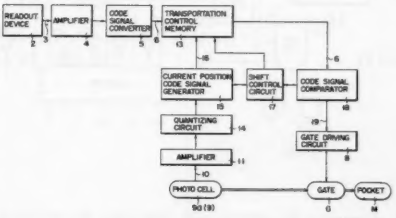


TORS, means for impressing a gate voltage which measures said second magnitude between the gate and the source of one of said MINSTORS, and current-measuring means connected to said network to measure the current passed by said sources and drains.

3,864,559
APPARATUS FOR CLASSIFYING SHEET-LIKE MATERIAL

Kenichi Mori, Yokohama; Naoto Nakayama, and Takeshi Osawa, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Dec. 21, 1973, Ser. No. 427,239
Int. Cl. G06k *9/00;* **G06f** *15/48*
U.S. Cl. 235—151.2 **5 Claims**



1. An apparatus for classifying sheet-like written material designed to transport a series of written pieces one by one on a passageway and receive a particular written piece in the designated one of a plurality of pockets provided along the passageway which corresponds to the classification code of the written piece, characterized in that the apparatus comprises means for reading out the classification code of a written piece and supplying a pocket designating code signal designating the pocket in which the written piece is to be received; means for supplying a current position code signal of a traveling written piece which means comprises a plurality of detectors disposed along the passageway and including those corresponding to each of the pockets and supplies the current position code signal when the traveling written piece passes through the detectors; a time-counting device for counting a length of time required for a transported written piece to cover a distance between any two adjacent detectors; a memory device including at least as many storing sections as a plurality of written pieces jointly traveling on the passageway at a given time, each of said storing sections being stored with a pocket-designating code signal designating a pocket associated with a given traveling written piece, data on the current position thereof and data on a length of time counted by the time-counting device; means for replacing the preceding time count of the time-counting device stored in the storing section by another time count freshly obtained thereby as

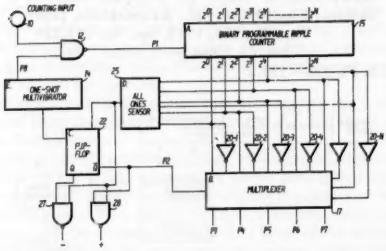
a traveling written piece passes through a distance between any two succeeding adjacent detectors; means for detecting whether the time count stored in the storing section lies within a prescribed range and, in that case, replacing data on the first current position of a written piece already stored in the storing section by data on the second current position of the written piece corresponding to a detector following that associated with the first current position of the written piece; means for comparing the pocket-designating data with data on the second current position of a written piece and, when a predetermined coincidence is detected to exist between both data, receiving the written piece in the designated pocket; and means for detecting whether a time count stored in the storing section lies outside of a prescribed range, and in that case, taking proper measures to cope with the abnormal condition in which a written piece was transported on the passageway.

3,864,560

DEVIATION VALUE GENERATOR

Daniel R. Dening, Quincy, Ill., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Dec. 11, 1972, Ser. No. 314,264
Int. Cl. G06f *7/50*
U.S. Cl. 235—151.13 **7 Claims**



1. Apparatus for continuously indicating the deviation of actual counted events from a predetermined count of events, comprising

programmable counter means programmed to count received incoming pulses in accordance with said predetermined count, for generating a pattern of digitally encoded outputs in response to each received said incoming pulse and being representative of an actual count of said received incoming pulses,

means for supplying pulses representative of occurrence of selected events as the input to said programmable counter means, and

means responsive to each said pattern of digitally encoded outputs of said programmable counter means, for converting said pattern of digitally encoded outputs to digital representations of the deviation of each actual count from the predetermined count, said digital representations including the sense of each deviation relative to the predetermined count,

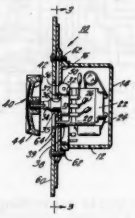
and wherein said counter means exhibits the characteristic of having two successive incoming pulse actuated non-deviation count conditions corresponding with a full count condition and a successive empty count condition, inhibiting means responsive to said full count condition for effectively inhibiting said counter from beinig successively actuated to a full count condition and then to said empty count condition in response to two successively received incoming pulses.

3,864,561

DIMMER SWITCH WITH ILLUMINATED KNOB

Joel S. Spira, Allentown; Joseph Licata, Schnecksville; Ira J. Pitel, and Lester E. Wenger, both of Quakertown, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Continuation of Ser. No. 342,532, March 19, 1973, abandoned. This application Apr. 23, 1974, Ser. No. 463,408
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 SP **12 Claims**



1. An illuminated electric light dimmer switch which can be wall-mounted and which is interchangeable with conventional wall-mounted on-off switches; said dimmer switch comprising, in combination:

an on-off switch and series-connected dimmer control means for controlling the flow of load current to an electric light load;

a manually adjustable potentiometer connected to said dimmer control means for manually controlling said dimmer control means; said potentiometer including an enclosed housing having a rotatably operable operating shaft extending therefrom, and an operating knob on the end of said operating shaft; said operating shaft being further operatively connected to said on-off switch to operate said on-off switch;

a fixed light source means for illuminating said operating knob; said light source means connected across said series-connected on-off switch and said dimmer control means, thereby to be energized at least when said on-off switch is in an off position;

a dimmer switch housing having said on-off switch, said dimmer control means, said light source means and said potentiometer enclosed housing mounted therein; said dimmer switch housing being mountable within the conventional well of the wall into which said dimmer switch is mounted;

a generally flat mounting plate secured across a side of said dimmer switch housing for mounting said dimmer switch; said mounting plate having a central opening therein; said potentiometer operating shaft extending through said opening, and said potentiometer enclosed housing having portions secured to the interior surface of said mounting plate and sealing said central opening;

said potentiometer enclosed housing having a second portion spaced away from the said interior surface of said mounting plate;

said mounting plate having a lamp opening therein which is removed from said central opening, but which is beneath said operating knob of said potentiometer, and which lamp opening is juxtaposed with said second portion of said potentiometer enclosed housing;

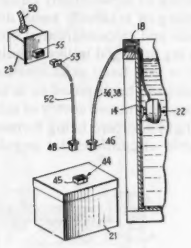
said light source means being fixedly mounted in the space between said interior surface of said generally flat mounting plate and said second portion of said potentiometer enclosed housing and adjacent said lamp opening whereby said light source means can illuminate the rear surface of said knob.

3,864,562

MEANS FOR ILLUMINATING UNDERWATER AREAS OF SWIMMING POOLS

Donald K. Hawkins, 5 Victory Ct., East Norwalk, Conn. 06855

Filed Oct. 19, 1973, Ser. No. 408,163
Int. Cl. F21p *1/00*; **F21v** *25/04*, *31/00*
U.S. Cl. 240—26 **9 Claims**



1. An underwater safety light for illuminating water-filled pools, comprising in combination:

a. a sealed beam incandescent lamp,

b. a cup-shaped molded plastic casing having a wide mouth constituting a window for passing light therethrough,

c. means for mounting the lamp in the casing in a position to direct light outward through the casing window, the face of said lamp spanning the window of the casing,

d. said casing constituting an enclosure in which the lamp is mounted,

e. current carrying lines passing through a wall of the casing, said lines being connected to the lamp to effect energization thereof,

f. means carried by said casing for mounting the same on an inside wall of the pool below the waterline thereof,

g. a battery disposed at a location exterior of the pool,

h. said current carrying lines extending to the battery to receive energization therefrom,

i. said battery being characterized by an output voltage of a sufficiently low magnitude so as to present no shock hazard to personnel inadvertently coming in contact with current carrying portions of said lines and lamp,

j. means for charging the battery,

k. a line cord leading from said battery and connected with said charging means to supply energy to the battery, and

l. safety means adapted to disconnect said current carrying lines from said battery and to connect the latter with the charger, whereby said lamp and current carrying lines are thereby positively electrically isolated from the charger and the battery whenever a circuit is established between the charger and the battery.

3,864,563

APPARATUS FOR RADIOGRAPHING THE JOINTS OF THE JAWS

Kazuo Hozumi, Kyoto, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Fushimi-ku, Kyoto, Japan

Filed July 9, 1973, Ser. No. 377,620
Claims priority, application Japan, July 18, 1972, 47-72248
Int. Cl. G03b *41/16*
U.S. Cl. 250—320 **19 Claims**

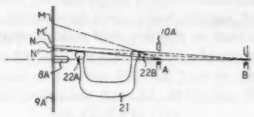
1. Apparatus for radiographing the joints of the jaws of a patient's head along a straight line connecting said joints so as to form a relatively clear image of one joint and a relatively blurred image of the other joint, said apparatus comprising:

head support means for supporting the head of a patient in a fixed position;

film support means located on one side of said head support means for supporting a film in a position such that said film will intersect an extension of the straight line connecting the joints of the jaws of a patient's head when a patient's head is held by said head support means;

an X-ray source;

X-ray source means for supporting said X-ray source on the other side of said head support means in a position such that the X-rays emitted by said X-ray source will travel along the straight line connecting the joints of the jaws of a patient's head when a patient's head is held in said head support means; and



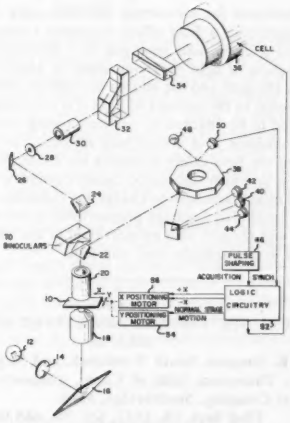
X-ray moving means operatively connected to said X-ray support means for moving said X-ray support means and said X-ray source along a path defined by an extension of the straight line connecting the joints of the jaws of a patient's head when a patient's head is held by said head support means as said X-ray source projects X-rays toward said film whereby a relatively clear image of the joint of the jaws nearest to said film and a relatively blurred image of the joint of the jaws nearest to said X-ray source are formed on said film.

3,864,564

ACQUISITION SYSTEM FOR SLIDE ANALYSIS

William J. Adkins, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed Sept. 26, 1973, Ser. No. 400,915
Int. Cl. G01j *1/20*
U.S. Cl. 250—201 **15 Claims**



1. In a system producing an electrical output representing the optical characteristics of an analytical slide containing a specimen of interest, including:

conversion means producing said electrical output representing the optical characteristics of said slide,

means for projecting an optical image of said analytical slide to said conversion means,

a light sensing device,

means for successively scanning a portion of said optical image, said light sensing device producing an output

representing the light absorption of the area of the slide being scanned,

a pulse shaping means connected to the output of said light sensing device and producing an acquisition signal when the area of the slide being scanned contains a specimen of interest, and

a positioning mechanism for positioning said slide, an acquisition system comprising:

synchronizing means producing a synchronizing signal at a predetermined point in each scan, and

logic circuitry responsive to said synchronizing signal and to said acquisition signal for producing control signals, said control signals being used to control said positioning mechanism to position said slide so that the image of a specimen of interest is centered on said conversion means.

3,864,565

LIGHT AMOUNT INTEGRATION MEANS

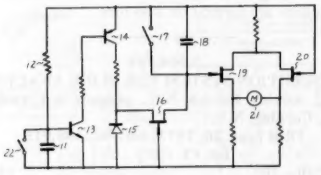
Masahiro Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Sept. 13, 1973, Ser. No. 396,894

Claims priority, application Japan, Sept. 21, 1972, 47-109952

Int. Cl. H01j *39/12*

U.S. Cl. 250—214 P **3 Claims**



1. Apparatus for measuring and indicating light amount, which comprises a field effect transistor having a source, a gate, and a drain, and arranged in a grounded-gate circuit configuration; a light receiving element which is connected between the gate and the source and which develops a signal proportional to the amount of light it is receiving; a capacitor connected to be charged by current flowing through the field effect transistor, and a switching element connected to the source of the field effect transistor for controlling a charging operation in which said signal causes current to flow through the field effect transistor to charge the capacitor across which there is developed a voltage proportional to the integral of the current and thereby also proportional to the amount of light received over a specific time duration.

3,864,566

OPTICAL SYSTEMS AND ASSOCIATED DETECTING MEANS

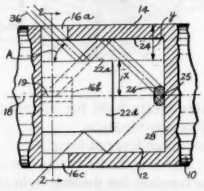
George R. Simpson, South Woodstock, and Stephen M. MacNeille, Thompson, both of Conn., assignors to American Optical Company, Southbridge, Mass.

Filed Sept. 18, 1957, Ser. No. 685,062

Int. Cl. H04j *3/14*

U.S. Cl. 250—216 **7 Claims**

1. An opaque main supporting housing and a light-collecting and detecting system disposed within said main supporting housing at a location intermediate the spaced opposite ends thereof said housing surrounding said light-collecting and detecting system and said system being arranged to simultaneously view from said location all parts of a predetermined endless annular object field outwardly of said main housing and in concentric relation to a longitudinal axis extending centrally through said housing, said system comprising a single photosensitive detecting element of relatively small predetermined size disposed at a fixed axial location in said main housing for detecting any appreciable change in light intensity occurring in any part of said object field, a plurality of similar light apertures circumferentially arranged in side wall portions of said housing, said light apertures being appreciably spaced from one another in said wall portions and with said wall portions between each pair of adjacent light apertures being of substantially equal size, each of said light apertures being of relatively small dimensions considered in both the axial and circumferential directions of said housing, and each being arranged in like angular relation to said longitudinal axis at said fixed axial location, thereby each of said light apertures will be disposed so as to face outwardly toward a different predetermined sector of said endless annular object field, each light aperture being formed so as to view a sector of appreciable circumferential angular value, and to admit



into said housing light from all parts of the sector aligned therewith, and all of said light apertures being so disposed relative to each other in said housing as to jointly simultaneously admit into said housing light from all parts of said endless annular object field, a plurality of optical systems within said housing, each of said optical systems being optically aligned with a different one of said light apertures, respectively, and with said photosensitive detecting element, and each of said optical systems comprising means providing a plurality of spaced optical surfaces including means having an optical surface for collecting substantially all of the light from said object field which enters the light aperture aligned therewith and for directing substantially all of the light so collected toward means providing a second optical surface, said second optical surface being a positive optical surface disposed so as to receive substantially all of said light and direct same as a convergent beam onto said photosensitive detecting element.

3,864,567

INFRARED DETECTOR SYSTEM

Robert V. Bez, Cincinnati, Ohio, assignor to Cincinnati Electronics Corporation, Evendale, Ohio

Filed June 13, 1957, Ser. No. 666,278

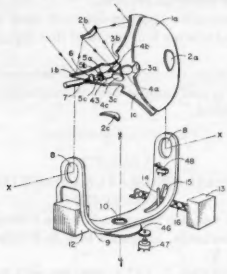
Int. Cl. G01d *5/36*

U.S. Cl. 250—232 **12 Claims**

1. An optical detector system comprising: a support having a vertical axis and being mounted for rotation on said vertical axis; a photodetector mounted on said support in fixed relationship to said support; an optical system having a horizontal axis, said optical system being mounted on said support for rotation on said horizontal axis, said optical system comprising three optical sets radially mounted on said support in fixed spaced relationship relative to one another 120 degrees apart, said optical sets being adapted to sweep in turn a predetermined vertical angle in space; each of said optical sets including a parabolic reflector for focusing optical images each of said reflectors having an optical axis, said parabolic reflector having a central aperture, a secondary mirror mounted along the optical axis of each reflector to reflect said focused images through said apertures, and a plane mirror mounted opposite each aperture for redirecting the reflected images from said secondary mirror and toward said photodetector; means for rotating said optical system at a high rate of speed about said

horizontal spin axis; and means for rotating said support at a relatively slow rate of speed about said vertical axis.

4. A passive optical detector comprising: a support having a vertical axis of rotation; a reflector system mounted on said support, said reflector system having a horizontal axis of rotation, said reflector system comprising at least one reflector, each reflector having an optical axis extending radially of said



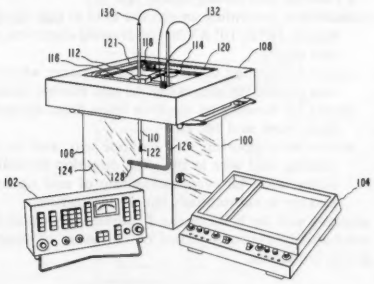
horizontal axis; photodetector apparatus mounted on said support in fixed relation with respect to said support; means in said reflector system for directing images from said reflector onto said photodetector apparatus; means for rotating said reflector system on said horizontal axis at a high rate of speed; and means for simultaneously oscillating said support at a slow rate of speed through a predetermined angle on said vertical axis.

3,864,568

AUTOMATIC ISODOSE PLOTTER

Alan L. Helgesson, Los Altos Hills, Calif., assignor to SHM Nuclear, Sunnyvale, Calif.

Filed June 19, 1972, Ser. No. 264,230
Int. Cl. G01n *23/00*
U.S. Cl. 250—252 **32 Claims**



1. Isodose plotting apparatus for plotting penetration type radiation measurements comprising:

phantom means at which a radiation source is directed and in which radiation measurements are taken,

detection means for taking radiation intensity measurements in said phantom means, said detection means having a moveable detector means which generates signals for measuring direct radiation intensity,

drive means having a plurality of drive axes for moving said detector means in said phantom means,

control means having a velocity control and a servo control responsive to signals from said detector means for moving said detector means under velocity control on a first drive axis and under servo control on a second drive axis along a path representative of a predetermined dosage within said phantom means, sensing means for sensing that a predetermined distance of movement of said detector on an axis under servo control has occurred relative to a predetermined distance of movement of an axis under velocity control, and

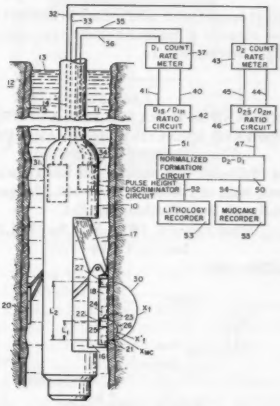
switching means responsive to said sensing means for automatically interchanging the drive axes under said velocity control and said servo control when a predetermined distance of movement of said detector means on said axis under servo control has occurred relative to a predetermined distance of movement on said axis under velocity control.

3,864,569

WELL LOGGING PROCESSING METHOD AND APPARATUS

Jay Tittman, Danbury, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 32,504, April 14, 1970, abandoned, which is a division of Ser. No. 654,414, July 19, 1967, Pat. No. 3,521,063. This application Apr. 13, 1973, Ser. No. 351,060
Int. Cl. G01t *1/16*
U.S. Cl. 250—264 **23 Claims**



1. A computer for identifying earth formation characteristics, comprising means for producing a first and a second signal corresponding to an energy spectrum of a plurality of photon intensities, said first signal corresponding to photon intensities in an energy spectrum below a predetermined energy level and the second signal corresponding to photon intensities in an energy spectrum greater than a predetermined energy level, means for normalizing said first and second signals, means for producing third and fourth signals that correspond to an energy spectrum of a plurality of photon intensities, said third signal corresponding to the photon intensities in an energy spectrum below a predetermined energy level and said fourth signal corresponding to photon intensities in an energy spectrum greater than a predetermined energy level, means for normalizing said third and fourth signals and means for combining said normalized signals to produce at least one signal that identifies earth formation characteristics.

3,864,570

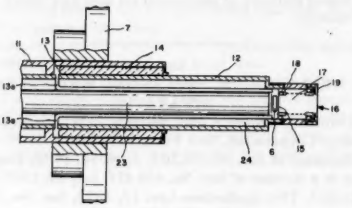
LOW ENERGY X-RAY DETECTOR

William P. Zingaro, 22 Clubway, Hartsdale, N.Y. 10530

Filed Sept. 24, 1973, Ser. No. 399,838
Int. Cl. G01n *23/20*
U.S. Cl. 250—272 **8 Claims**

1. A detector for low energy x-rays adapted to operate in an evacuable chamber in which said x-rays are produced comprising a contaminant-sensitive element responsive at cryogenic temperatures to low-energy x-rays, a pair of spaced x-ray permeable membranes separating said x-rays responsive element from the interior of said chamber, said membranes defining a space which is connected with the interior of said

chamber through a passageway, filter means within said passage for removing foreign materials which are capable of contaminating said x-ray-responsive element and rendering



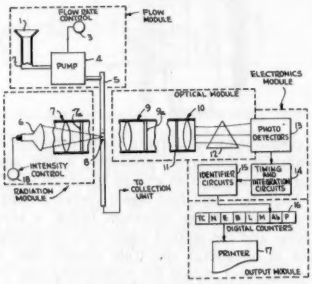
said element inoperative, and means in contact with said x-ray responsive element to maintain said x-rays responsive element at a cryogenic temperature.

3,864,571

METHOD AND APPARATUS FOR AUTOMATICALLY, IDENTIFYING AND COUNTING VARIOUS CELLS IN BODY FLUIDS

Irving M. Stillman, Columbia; Neil M. Trowe, and Jules R. Clemens, both of Potomac, all of Md., assignors to Wheeler International, Inc., Washington, D.C.

Filed Feb. 10, 1971, Ser. No. 114,297
Int. Cl. G01n *21/26*
U.S. Cl. 250—302 **43 Claims**



1. The process of differentiating leukocytes in a sample of body fluid comprising the steps of:

a. Obtaining at least a one cubic millimeter sample of the body fluid;

b. Treating said sample with a fluorochrome material that will cause radiation of a characteristic wavelength to be emitted from at least one of the sub-cellular materials when subjected to radiation in the range of 0.30 to 30 microns;

c. Initiating relative movement between the sample and a radiation source which has at least one associated coplanar radiation detection means;

d. Continuing the relative motion until the complete sample has passed the radiation source and the at least one coplanar radiation detector in a manner so that the leukocytes in a substantial portion of the sample are in a single cellular array as they pass said plane;

e. Causing said radiation source to irradiate the sample as the leukocytes pass in said single cellular array;

f. Measuring the overall cell sizes of the cells passing said plane by detecting the initiation of the secondary fluorescent emissions with said radiation detection means and continuing said detection until each cell has passed said plane;

g. Simultaneously determining the amount of each sub-cellular material present in each cell as it passes said plane by detecting the characteristic radiations being emitted by each sub-cellular material in each cell;

h. Feeding these determinations for each cell as it passes said plane to a logic means wherein the cell is identified on the basis of total cell size and the relative amounts of sub-cellular material present;

i. Causing a separate counter for each type of leukocyte to be advanced when a leukocyte of that type is identified by steps;

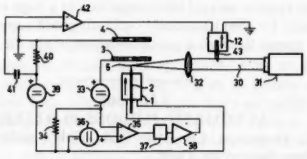
j. Repeating steps (e) to (i) to until substantially all of the leukocytes is said sample have passed said plane and have been identified.

3,864,572

ELECTRON BEAM APPARATUS COMPRISING A POINT CATHODE

Karel Diederick van der Mast, and James Edmond Barth, both of Delft, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 2, 1973, Ser. No. 402,844
Int. Cl. H01j *37/26*
U.S. Cl. 250—306 **9 Claims**



1. An electron beam source, comprising:

a cathode wire having a free tip;

means for generating an electric field at said tip of approximately 10^5 to 10^6 KV/m for drawing electrons away from said tip;

means for heating said tip to a temperature where deformation of said tip occurs due to said electric field;

means for forming an electron beam from electrons drawn away from said tip; and

means for supporting said cathode wire and for slowly advancing said wire in the axial direction thereof in accordance with the evaporation rate of said tip to maintain said tip in substantially the same position,

whereby said tip is maintained substantially point-like with a substantially constant radius of curvature of approximately 0.2 to 2 microns.

3,864,573

WIDE-RANGE RADIATION GAGE FOR DETERMINING A MATERIAL PROPERTY

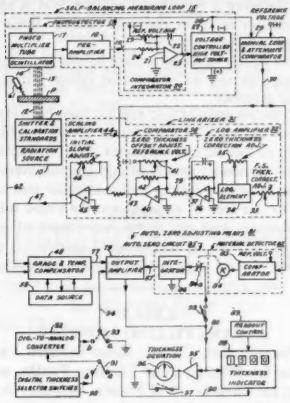
Carvel D. Hoffman, Whitehall, and Duane T. Jones, Coopersburg, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Aug. 20, 1973, Ser. No. 389,749
Int. Cl. G01t *1/20*
U.S. Cl. 250—358 **16 Claims**

1. In a material measuring system which converts radiation into a light source that varies as a function of a material property and a conversion error due to radiation source decay, said system having a self-balancing measuring loop which includes a controlled-gain photodetector responsive to said variable light source and subject to a gain error caused by photodetector aging, said measuring loop also including comparator means operative therein to cause the production of a material measuring signal which varies as a function of said variable light source and said conversion and gain errors, said errors

having an undesirable effect on measuring loop stability, the improvement comprising:

a. integrator means circuited to modify said comparator means for stabilizing the self-balancing measuring loop



against the undesirable effects of said conversion and gain errors, and

b. means for utilizing the stabilized measuring signal to determine a value of said material property.

3,864,574

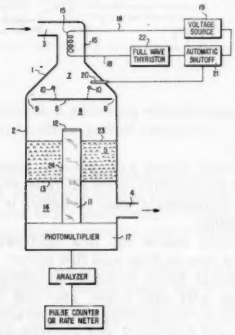
APPARATUS FOR MEASURING IODINE

Jurgen Wilhelm, Karlsruhe; Kurt Geriach, Buechenau, and Heinrich Mahnau, Hamburg, all of Germany, assignors to Gesellschaft fur Kermforschung mbH, Karlsruhe and Herfurth GmbH, Hamburg, both of, Germany

Filed Mar. 14, 1973, Ser. No. 341,172

Int. Cl. G01t *1/20*

U.S. Cl. 250—364 **12 Claims**



1. An apparatus for measuring the radioactive iodine isotope **131** in air by means of detecting the quantum radiation generated by the decomposition of said iodine, said iodine being present in air in elemental and chemically bound form, comprising:

a. a conduit carrying air containing said iodine, said conduit having an inner wall face;

b. a scintillator disposed in said conduit and oriented in an axially coextensive relationship therewith;

c. a filter for adsorbing said iodine in its elemental form and in its chemically bound form, said filter entirely surrounding at least one length portion of said scintillator and fully occupying the entire cross section of said conduit between said scintillator and said inner wall face along any point of said length portion; and

d. means provided in said conduit downstream of said filter for accommodating a photomultiplier at an end of said scintillator, said end being situated downstream of said filter.

3,864,575

CONTACT IONIZATION ION SOURCE

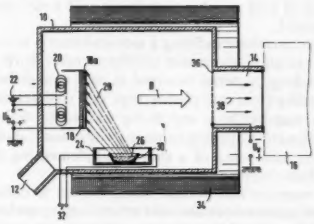
Nujeeb Hashmi, Konigsbergerstrasse 10, Garching, and Adriaan Julius Van Der Houven Van Oordt, Oneginstrasse 8, Munich, both of Germany

Continuation of Ser. No. 162,489, July 14, 1971, abandoned. This application May 31, 1973, Ser. No. 365,621

Claims priority, application Germany, July 25, 1970, 2037029

Int. Cl. H01j *39/34*

U.S. Cl. 250—423 **8 Claims**



1. An ion source for use in an evacuated vessel, said source comprising:

means for supplying a gaseous or vaporized ionizable material in said evacuated vessel;

an ionization electrode having at least one active surface of substantial area formed of a material capable of ionizing said ionizable material by contact therewith;

means for heating said ionization electrode;

an open-structured electrode having a multiplicity of openings therein and spaced from said active surface or surfaces by space free of intervening field-affecting structures;

means for producing and maintaining, in the space between said active surface or surfaces and said open-structured electrode, a magnetic field of a character favoring the formation in said space of a stable plasma, and

means for applying to said open-structured electrode an electro-negative potential barely sufficient to repel electrons issuing from said plasma and to favor movement through said electrode of ions issuing from said plasma.

3,864,576

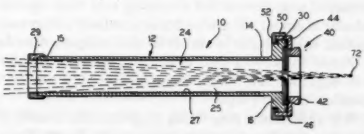
POSITION INDICATING DEVICE FOR DENTAL X-RAY MACHINES

Charles F. Stevenson, Elgin, Ill., assignor to Rinn Corporation, Elgin, Ill.

Filed Sept. 27, 1973, Ser. No. 401,409

Int. Cl. G21f *5/04*

U.S. Cl. 250—505 **4 Claims**



1. In a position indicating device for x-ray machines, wherein said device includes a tubular member that is rectilinear axially of same, with said member defining a bore of rect-

angular transverse cross-sectional configuration that extends the length of same and having its internal surfacing lined for x-ray absorption and defining an x-ray receiving end and an x-ray emitting end, and an adapter member for securing said tubular member to an x-ray machine and secured to said x-ray receiving end of said tubular member,

the improvement wherein:

said tubular member at said x-ray receiving end of same is formed to define a round hub portion having a peripheral rib integral therewith and thereabout defining annular bearing surfaces on either side of same that lie in parallel planes extending normally of said tubular member,

with one of said bearing surfaces facing in the direction of said tubular member x-ray emitting end and the other of said bearing surfaces facing in the direction of said tubular member x-ray receiving end,

said member hub portion being formed with a circular counterbore that faces oppositely of said x-ray emitting end of said member and lies at said x-ray receiving end thereof,

said counterbore defining a side wall that is in circumambient relation about said tubular member bore,

collimating material received in said counterbore and extending from said counterbore side wall across said tubular member bore and being formed to define an x-ray collimating opening centered within said tubular member bore and being of a shape complementing that of said tubular member emitting end,

said member hub portion being formed to define between said counterbore and said other bearing surface an annular face that forms the terminal end surface of said tubular member at said x-ray receiving end of same,

with an annular retaining disc being received in said counterbore about the portion of said collimating material adjacent said counterbore side wall,

means for fixing said retaining disc to said tubular member to secure said collimating material to said tubular member within said counterbore,

said disc extending short of said tubular member end surface axially of said tubular member and being separated from said adapter member,

said adapter member further comprising:

a hub portion including means for securing same to the x-ray machine in the mounted position of said device,

said adapter member hub portion defining a radial flange having a bearing surface and an axially extending rim wall defining a socket in which said tubular member hub portion is received with said peripheral rib being encompassed by said adapter member rim wall and said adapter member flange bearing surface opposing said rib other bearing surface,

a securing collar received over said adapter member rim wall and defining a radial flange directed radially inwardly of said collar and having a bearing surface that opposes said rib one bearing surface,

a first antifriction ring interposed between said one bearing surface of said rib and said collar flange bearing surface in face to face engagement therewith,

a second antifriction ring interposed between said rib other bearing surface and said adapter member flange bearing surface in face to face engagement therewith,

said collar and said adapter member rim wall having threaded engagement for clamping said rings against said tubular member rib under predetermined compression to journal said tubular member in said adapter member,

and means for keying said collar and adapter member rim wall together for maintaining said predetermined compression of said rings,

said first antifriction ring being proportioned axially of said tubular member to space said collar flange from said adapter member rim wall when said first ring is clamped between said rib one bearing surface and said collar flange bearing surface,

said second antifriction ring being proportioned axially of said tubular member to space said adapter member flange from said tubular member end surface when said second ring is clamped between said rib other bearing surface and said adapter member flange bearing surface,

said rib defining a peripheral surface that is spaced from said adapter member rim wall radially inwardly of said adapter member rim wall,

said collar flange defining a bore having an internal diameter proportioned to space said collar flange from said tubular member,

whereby, on rotation of said tubular member relative to said adapter member for adjustment of said tubular member relative to said adapter member, said collimating opening remains stationary axially of said adapter member for 360 degrees of such rotation, and said collar and said adapter member are free of engagement with said tubular member whereby said rotational movement of said tubular member relative to said adapter member is opposed by frictional forces only at said bearing surfaces.

I.C.

3,864,577

TANK FILLING MONITOR

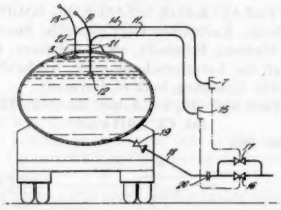
Jacques Pierre Pellett, Chatou; Henri Bernard Andre Baisan, St. Genie les Ollieres; Jean Lievaux, Pantin, and Georges Patchett, Le Chesnay, all of France, assignors to The British Petroleum Company Limited, London, England

Filed Nov. 7, 1973, Ser. No. 413,497

Claims priority, application France, Nov. 7, 1972, 72.39401

Int. Cl. G01n *21/46*

U.S. Cl. 250—577 **3 Claims**



1. An apparatus for providing a desired liquid level during filling of a contaianer having a filler valve coupled thereto comprising:

a first prism having a downwardly pointing apex, said first prism being totally internally reflecting in air and substantially transmitting when immersed in a container including liquid;

light source means and first light detecting means positioned remote from said first prism;

first optical fibers optically coupling said light source means, said first prism, and said first light detecting means, for transmitting light from said light source means into said first prism and for transmitting light which is totally internally reflected in said first prism to said first light detecting means, said first optical fibers including a portion common to the incident light and the reflected light from said first prism;

said first light detecting means initiating closure of the filler valve when the light intensity received from said first prism falls below a predetermined threshold;

a second prism having a downwardly pointing apex, said second prism being totally internally reflecting in air and substantially transmitting when immersed in a container including liquid, said second prism being positioned at a lower level than the desired liquid level which is determined by said first prism;

a second light detecting means positioned remote from said second prism;

second optical fibers optically coupling said light source means, said second prism, and said second light detecting means, for transmitting light from said light source means into said second prism and for transmitting light which is totally internally reflected in said second prism to said second light detecting means, said second optical fibers including a portion common to the incident light and the reflected light from said second prism; and

said second light detecting means reducing the flow of liquid through the filler valve when the light intensity received from the second prism falls below a predetermined threshold.

3,864,578

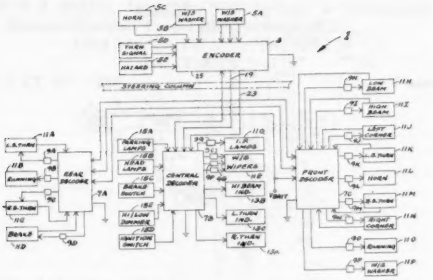
MULTIPLEX SYSTEM FOR A VEHICLE

Robert P. Lackey, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 26, 1973, Ser. No. 428,289

Int. Cl. G08c *15/12*

U.S. Cl. 307—10 R **26 Claims**



1. A multiplex system for controlling operation of vehicle components such as windshield wipers, turn signals, and cornering lamps responsive to the positioning of respective corresponding operator actuatable controls, said multiplex system comprising:

encoding means responsive to the position of each of said controls for providing a timing signal and a code signal having signal components corresponding to the respective positions of each of said controls, said encoding means having a standby mode of operation wherein said encoding means provides no signals and draws no significant current;

decoding means remote from said encoding means and responsive to said signals selectively to provide a plurality of respective outputs in response to the respective code signal components, said decoding means being responsive to the absence of at least one of said signals to go into a standby mode of operation wherein it supplies none of said outputs and draws no significant current; and

relay means respectively responsive to said outputs of said decoding means for selectively energizing each of said vehicle components whereby said operator actuatable controls control energization of corresponding vehicle components without connection of each of said controls by individual conductors to said respective relay means.

3,864,579

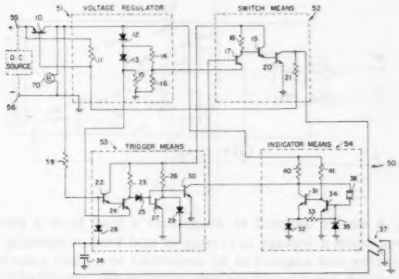
VOLTAGE REGULATING CIRCUIT PROVIDING PLURAL OUTPUTS

Charles H. Klasing, Indianapolis, Ind., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Division of Ser. No. 152,085, June 11, 1971, Pat. No. 3,763,488, which is a continuation of Ser. No. 752,576, Aug. 14, 1968, abandoned. This application June 29, 1973, Ser. No. 374,909

Int. Cl. H02j *1/00*

U.S. Cl. 307—15 **2 Claims**



1. In a voltage regulating means wherein a single variable output voltage provides two output voltages, the ratio of the output voltages remaining constant, a first diode in series with said output voltage, and a parallel combination of a second diode and a resistance means connected in series and serially connected resistance means, said parallel combination connected to said first diode, one of said output voltages connected between said second diode and said resistance means, the other of said output voltages connected to said serially connected resistance means.

3,864,580

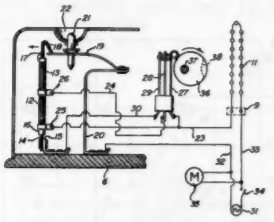
CHRISTMAS TREE LIGHTING CONTROL

George B. Davis, Jr., 7512 Marbury Rd., Bethesda, Md. 20034

Continuation-in-part of Ser. Nos. 342,433, March 19, 1973,, and Ser. No. 338,832, March 7, 1973,. This application Nov. 23, 1973, Ser. No. 418,262

Int. Cl. H02j *3/00*

U.S. Cl. 307—31 **15 Claims**



1. A light intensity control for Christmas tree lighting including in combination connector means for connecting said control to a power supply source, an electrical outlet continuously in circuit with said power supply connector means for connecting thereto one or more strings of Christmas tree lights, voltage dropping resistor means forming a part of said control and electrically connected in series with said outlet for reducing the voltage to said outlet proportional to the resistance in said circuit, circuit controlling means electrically connected across said resistor means and operable to intermittently short out portions of said resistor means to increase and

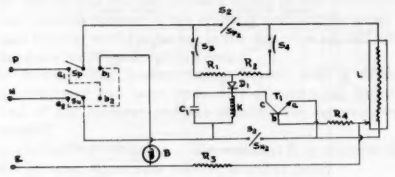
decrease in predetermined fixed increments, the voltage to said outlet.

3,864,581

SHOCK PREVENTION DEVICE

Varahur Srinivasa Satyanarayana, 38C Irwin Rd., New Delhi, India

Filed Jan. 22, 1973, Ser. No. 325,419
Int. Cl. H02h *3/16*
U.S. Cl. 307—92 **10 Claims**



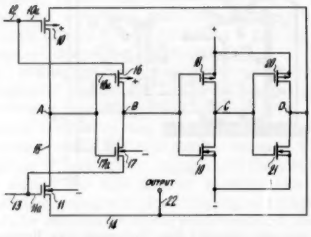
1. A device adapted to disconnect a load from a power source upon a leakage occurring in said load comprising an energizing coil adapted to be connected to a main source, a first switch capable of being closed upon the energization of said coil and thereby connecting a load to the power source, a transistor connected to the energizing coil and having a biasing means, said transistor and biasing means adapted to be connected to said load, such that upon a leakage occurring in the body of the load the transistor is biased and thereby deenergizes said coil and whereby said first switch is opened, and means for preventing a shock to a human body upon contacting a live conductor of the load and which comprises a current transformer connected to said first switch, the secondary of said transformer connected to said transistor through a second biasing means such that said transistor is capable of being biased by said first and/or second biasing means and whereby the coil is deenergized and the first said switch opened.

3,864,582

MOSFET DYNAMIC CIRCUIT

Eugene R. Keeler, Suffern, N.Y., assignor to Timex Corporation, Waterbury, Conn.

Filed Jan. 22, 1973, Ser. No. 325,302
Int. Cl. H03k *21/00, 23/02*
U.S. Cl. 307—225 C **2 Claims**



1. A divide-by-two dynamic counter circuit consisting of at least three inverters, each of which is a complementary pair of MOSFET transistors, each of said transistors having a control gate electrode and a drain electrode, and a source electrode; the circuit including a first pair of such transistors, each of which has its source electrodes connected to respective sources of reversing relative polarity so that each source receives reversals of polarity which are out-of-phase in respect to each other;

a second pair of such transistors, each of such second pair of transistors having its gate electrode connected to between common drain electrodes of said first pair and whose source electrodes are connected to said respective sources of reversing polarity and whose drain electrodes are connected together; and

a third pair of such transistors whose gate electrodes are both connected to said common drain electrodes of said second pair;

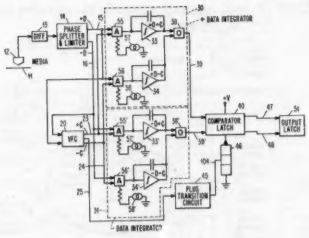
the output being taken at the common drain electrodes of said third pair, and the gate electrodes of said first pair being connected to the common drain electrodes of said third pair.

3,864,583

DETECTION OF DIGITAL DATA USING INTEGRATION TECHNIQUES

Benjamin C. Fiorino, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 197,906, Nov. 11, 1971, abandoned, which is a continuation-in-part of Ser. No. 76,145, Sept. 28, 1970, abandoned. This application Apr. 23, 1973, Ser. No. 353,824
Int. Cl. H03k *5/18, 5/153;* **H03d** *3/18*
U.S. Cl. 307—235 R **55 Claims**



13. Predetection integration for use with amplitude limited signals, a first-limited signal being supplied along a first line and a second limited signal being supplied along a second line; timing means responsive to one of said limited signals for generating a clocking signal having first and second signal states of respective durations substantially equal to predetermined durations of corresponding first and second signal states of said one limited signal;

first integration means jointly responsive to said first limited signal being in a first signal state and to said clock signal being in a first signal state to integrate time duration of said limited signal being in said first signal state and being further responsive to said clock signal being in a second signal state to alter the integrated signal toward a reference state at a rate slightly greater than said rate of integration;

second integration means jointly responsive to said first limited signal being in said first signal state and to said clock signal being in said second signal state to integrate the duration of said limited signal being in said first signal state and being further responsive to said clock signal being in said first signal state to alter the integrated signal toward a reference value at a rate sightly greater than the rate of integration;

third integration means jointly responsive to said second limited signal being in a second signal state and to said clock signal being in said first signal state to integrate the duration of said second limited signal being in said second signal state and being further responsive to said clock signal being in said signal state to alter the integrated signal toward a reference state at a rate slightly greater than the rate of integration;

fourth integration means jointly responsive to said second limited signal being in said second signal state and to said clock signal being in said second signal state to integrate the duration of said limited signal being in said second signal state and being further responsive to said clock signal being in said first signal state to alter the integrated signal toward a reference state at a rate slightly greater than the rate of integration; and

signal combining means respectively combining the integrated signals from said first and second integration means for supplying a first combined signal indicating duration of the first signal state in said first limited signal and further combining integrated signals from said third and fourth integrator means for supplying a second combined signal indicating the duration of said second limited signal being in said second signal state.

14. The subject matter set forth in claim 13 further including voltage comparison means including bistable means jointly responsive to said combined signals for setting the bistable means to a first signal state when the first combined signal has an amplitude greater than the second combined signal and to the second signal state in the reverse situation, a change in the stable states of bistable means indicating that said limited signals have changed signal states.

3,864,584

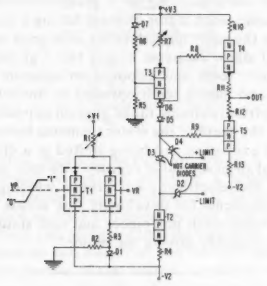
HIGH SPEED PROGRAMMABLE DRIVER CIRCUIT

David J. Hutson, Apalachin, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,120

Int. Cl. H03k *5/12*

U.S. Cl. 307—268 **1 Claim**



1. A circuit, for controlling turn-on and turn-off delays of a digital switching circuit, comprising:

means for generating a constant current;

a first hot carrier diode connected between said constant current generator means and a first limit voltage;

a second hot carrier diode connected to a second limit voltage for establishing a second voltage limit;

switch means connected to said second hot carrier diode and to a first element of a third hot carrier diode which has a second element thereof connected to a junction of said constant current generator and said first hot carrier diode;

wherein said first hot carrier diode establishes a first voltage limit for an output signal and said second hot carrier diode establishes a second voltage limit for said output signal, and

wherein said first and second hot carrier diodes control circuit turn-on and turn-off delays within predetermined limits.

3,864,585

VIDICON HAVING MESH ON END OF CYLINDER COAXIAL WITH ANODE

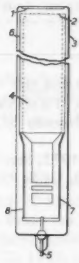
Hans Scholz, Essex, England, assignor to English Electric Valve Company Limited, Chelmsford, Essex, England

Filed July 5, 1973, Ser. No. 376,551

Claims priority, application Great Britain, July 6, 1972, 31662/72

Int. Cl. H01j *31/38, 29/45, 29/08*

U.S. Cl. 313—390 **5 Claims**



1. A vidicon tube including within an envelope, a target, a target electrode in electrical contact with the target, an anode of which the portion nearest the target is cylindrical, a field mesh electrically isolated from the positioned closely adjacent the target electrode between the target electrode and the cylindrical portion of the anode, terminal means passing through the envelope, and electrical connection means electrically connecting the terminal means to the field mesh; wherein, the electrical connection means includes a conductive cylindrical member coaxial with and surrounding the anode and extending at least approximately to the end of the cylindrical portion of the anode, the opposite end portions of the cylindrical member being electrically connected, respectively, to the perimeter of the field mesh and to a plurality of electrical conductors which are disposed symmetrically about the axis of the tube and extend to the terminal means.

3,864,586

VIBRATOR AND VIBRATORY SYSTEM

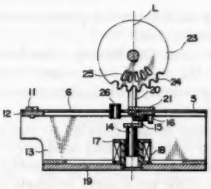
Hiroshi Saito, Omiya, Japan, assignor to Kabushiki Kaisha Seikosha, Tokyo, Japan

Filed Sept. 13, 1973, Ser. No. 396,675

Claims priority, application Japan, Sept. 14, 1972, 47-92301; Oct. 20, 1972, 47-105064

Int. Cl. H02k *7/06*

U.S. Cl. 310—21 **9 Claims**



1. A mechanical vibrator for a timepiece or the like comprising: a vibratory unit composed of resilient sheet material and having two main vibratory arms disposed in spaced-apart generally parallel relationship, two connecting end portions each interconnecting adjacent ends of said two main vibratory arms, and two central vibratory arms connected to respective ones of said connecting end portions and extending inwardly towards each other, and configured to vibrate, when sup-

ported at one said connecting end portion and suitably energized, in a normal vibrational mode wherein said two main vibratory arms along with the one central vibratory arm which is located remote from said one connecting end portion all flexurally vibrate in the same sense about their respective ends of connection while the other central vibratory arm which is connected to said one connecting end portion flexurally vibrates in the opposite sense about its end of connection such that the free end of said one central vibratory arm undergoes substantial linear vibratory movement; and means including a magnet secured to the free end of said one central vibratory arm for energizing said vibratory unit in its normal vibrational mode.

3,864,587

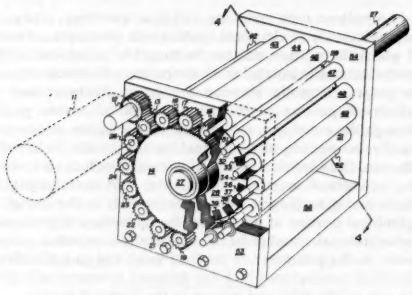
MAGNETIC TRANSMISSION

Alfred Landry, 7589 Calvocado St., Lemon Grove, Calif. 92045

Filed Aug. 23, 1972, Ser. No. 283,077

Int. Cl. H02k *49/06*

U.S. Cl. 310—103 **8 Claims**



1. A magnetic transmission comprising:

a. an output shaft,

b. a free-rotating armature carried by said output shaft,

c. a plurality of permanent magnets carried by said armature,

d. said permanent magnets being magnetically oriented with each adjacent magnet having opposite magnetic polarities,

e. a plurality of drive rotor permanent magnets rotatably mounted on an axis,

f. each drive rotor axis having a fixed radial position with respect to the axis of said output shaft and disposed in magnetic proximity with said permanent magnets carried by said armature, and

g. an input drive means coupled to said drive rotor permanent magnets for rotating said drive rotor permanent magnets in a synchronous relationship,

h. said drive rotor permanent magnets being magnetically oriented for rotating said armature at a speed proportional to the rotating speed of said drive rotor permanent magnets,

i. said permanent magnets carried by said armature and said drive rotor permanent magnets being disposed in discreet sectors in 360°,

j. the permanent magnets carried by said armature having an odd number in each sector and said drive rotor magnets having one less than said odd number in each sector.

3,864,588

ELECTRIC PULSE MOTOR

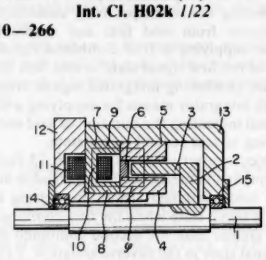
Seiuemon Inaba, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 110,084, Jan. 27, 1971, abandoned. This application Nov. 8, 1972, Ser. No. 304,657

Claims priority, application Japan, Feb. 7, 1970, 45-12589[U]; Feb. 7, 1970, 45-12590[U]

Int. Cl. H02k *1/22*

U.S. Cl. 310—266 **4 Claims**



1. An electric pulse motor comprising: a rotor provided with a single cup-shaped rotor element rotatable about an axis of rotation of the rotor shaft, the rotor element having a plurality of circumferentially spaced rotor-teeth disposed circumferentially of the axis of rotation of the rotor element, said rotor-teeth extending axially and having an equal spacing, thereby having a common and equal pitch, said rotor-teeth comprising magnetic polepieces; a stator provided with a plurality of U-shaped separate stator elements disposed circumferentially of the single cup-shaped rotor element to encircle the rotor element and corresponding to a predetermined number of different phases, each stator element having a base leg axially spaced from the rotor-teeth defining axial gaps therebetween, each of said stator elements having two legs radially spaced from the rotor teeth and disposed on opposite sides of the rotor-teeth and having teeth opposed to the rotor-teeth and spaced therefrom, defining radial gaps on opposite sides of the rotor-teeth, the teeth of the stator elements behaving as polepieces upon excitation and being shifted in a circumferential direction out of exact radial registry with said corresponding rotor-teeth, and electrically energizable windings on each of said stator elements for developing flux across the gaps between said rotor-teeth polepieces and said stator-teeth polepieeces for rotatably driving the motor.

3,864,589

MATRIX PICTURE DISPLAY DEVICE USING LIQUID THAT IS REVERSIBLY REDUCIBLE AND OXIDISABLE BY ELECTRIC CURRENT

Cornelis Johannes Schoot; Johannes Jacobus Ponjee; Rudolf Alexander Van Doorn, and Pieter Tammo Bolwijn, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 4, 1974, Ser. No. 447,849

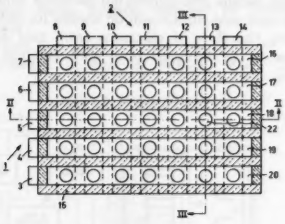
Claims priority, application Netherlands, Mar. 16, 1973, 7303674

Int. Cl. G02f *1/28;* **H01j** *1/58*

U.S. Cl. 313—232 **4 Claims**

1. A picture display device comprising between two supporting plates of which at least one is transparent a solution of a material which is reversibly reducible and oxidisable by means of an electric current, which solution is in contact with at least two electrodes, characterized in that the space between the two supporting plates comprises a number of elongate non-communicating compartments which are filled with the said solution, that an elongate electrode extends in each of the said compartments and belongs to a first set of elec-

trodes and is in contact with liquid in the relevant compartment only, and that the device comprises a second set of



elongate electrodes which are each in contact with the liquid in each of the said compartments.

3,864,590

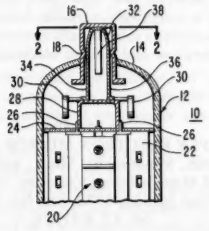
ELECTRON DISCHARGE DEVICE HAVING A HOLLOW CONDUCTOR INTEGRAL WITH THE ENVELOPE THEREOF

Richard William Young, Madison, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 10, 1973, Ser. No. 423,473

Int. Cl. H01j *5/52*

U.S. Cl. 313—318 **2 Claims**



1. An electric discharge device comprising a closed envelope, an electrode within said envelope, a hollow metal conductor sealed through said envelope, said hollow conductor having a closed portion extending outside said envelope and an open portion extending within said envelope, and a metal connector fixed to said electrode and having a part extending into said open portion of said hollow conductor, said connector part comprising a plurality of resilient appendages press-fitted into said open conductor portion and in resilient contact with the inner wall of said hollow conductor.

3,864,591

LUMINESCENT DISPLAY TUBE ANODE ASSEMBLY COMPRISING ANODE STRUCTURES HAVING CHANNEL-SHAPED CONDUCTIVE LAYERS

Fumitake Akahane; Masaki Kobayakawa, and Kazufumi Yawata, all of Kagoshima, Japan, assignors to Nippon Electric Kagoshima, Limited, Kogoshima, Japan

Filed May 8, 1974, Ser. No. 468,294

Claims priority, application Japan, May 14, 1973, 48-56967[U]; June 8, 1973, 48-68439[U]

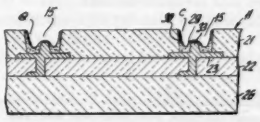
Int. Cl. H01j *1/66, 63/02*

U.S. Cl. 313—496 **9 Claims**

1. An anode assembly for a luminescent display tube includes:

a substrate having a plurality of recesses formed in a major surface of said substrate, each of said recesses having a bottom surface and a peripheral wall surface;

a plurality of anode structures, each of said anode structures being disposed in one of said recesses, each of said anode structures including a layer of electrically conductive material disposed on said bottom surface of said one recess, at least one projecting member of electroconductive material which projecting member is contiguous with



and extends outwardly from said electrically conductive layer, and a layer of luminescent material covering said electrically conductive layer and said at least one projecting member.

3,864,592

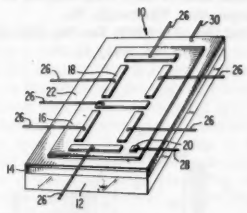
ELECTROLUMINESCENT SEMICONDUCTOR DISPLAY

Jacques Isaac Pankove, Princeton, N.J., assignor to RCA Corporation, ISE City, Mie Prefecture, Japan

Filed Mar. 22, 1973, Ser. No. 343,736

Int. Cl. H05b *33/14*

U.S. Cl. 313—503 **4 Claims**



1. A semiconductor electroluminescent display comprising:

a substrate of an electrically insulating, optically transparent material,

a layer of optically transparent, conductive gallium nitride on a surface of said substrate,

a continuous body of insulating gallium nitride on a surface of said conductive gallium nitride layer, said body being of an area smaller than the area of the surface of said conductive gallium nitride layer so that a portion of the surface of said conductive gallium nitride layer is not covered by said body,

a metal contact on the uncovered surface of said conductive gallium nitride layer, and

a plurality of electrically conductive electrodes on the surface of said body away from the conductive gallium nitride layer, with said electrodes being arranged in a desired display pattern.

3,864,593

FLAT FLUORESCENT LETTER DISPLAY TUBES

Kazuhiko Kasano, Ise, Japan, assignor to Ise Electronics Corporation, ISE City, Mie Prefecture, Japan

Filed May 23, 1973, Ser. No. 362,919

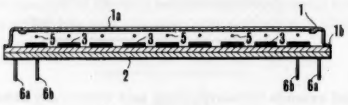
Claims priority, application Japan, May 23, 1972, 47-50396

Int. Cl. H01j *7/42*

U.S. Cl. 313—514 **2 Claims**

1. In a flat fluorescent letter display tube of the type wherein a plurality of letter display units are arranged on a straight line on an insulative substrate, each of said letter display units having a plurality of segment electrodes arranged in a predetermined configuration, an electrode provided with perforations adapted to contain said segment electrodes and a control

grid mounted on said perforated electrode to cover said perforations and said segment electrodes and disposed in a sealed envelope including a transparent upper half and a lower half which are joined together in an air tight fashion, said display tube further comprises a plurality of filament supports mounted on said substrate on both sides of the array of said letter display units, a plurality of filaments mounted on the



opposing filament supports, such that at least one filament extends above each letter display unit, the improvement in which said plurality of segment electrodes, terminals for said electrodes with perforations, terminals for said filaments and a metal film are printed on said substrate; and means for heating said metal film and air tightly joining said upper half to said substrate thereby completing said sealed envelope.

3,864,594

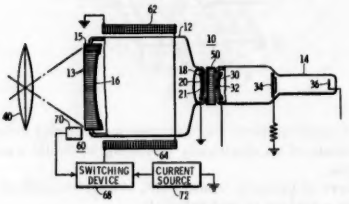
PROTECTION SYSTEM FOR AN IMAGE TUBE

Emil L. Svensson, Ellicott City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1969, Ser. No. 889,602

Int. Cl. H01j *31/26*

U.S. Cl. 315—10 **6 Claims**



1. An image system comprising an image tube, said image system responsive to input radiations, said image tube comprising means for generating an electron beam and directing it onto a target, deflection means positioned exterior to said image tube for deflecting said electron beam, means responsive to said input radiations greater than a predetermined value to cause energization of said deflection means to deflect said electron beam from the active area of said target.

3,864,595

AUTOMATIC BRIGHTNESS CONTROL FOR GATED MICRO-CHANNEL PLATE INTENSIFIER

George N. Lawrence, Baltimore, Md., and Melvin C. Seid, Aspen, Colo., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 19, 1973, Ser. No. 352,825

Int. Cl. H01j *29/70*

U.S. Cl. 315—12 **7 Claims**

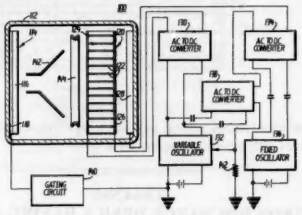
1. An image intensifier device comprising:

a. photocathode means responsive to incident radiation image for generating a corresponding electron image;

b. electron multiplying means for multiplying the electron image derived from said photocathode means, said electron multiplying means including an input electrode and an output electrode;

c. display means responsive to the multiplied electron image for providing a visual radiation image corresponding thereto;

d. gating means interconnected between said input electrode and said photocathode means for selectively permitting the flow of electrons from said photocathode means to be directed onto said electron multiplying means;



e. brightness control means responsive to the current of the multiplied electron image directed onto said display means for varying the potential applied between said input electrode and said output electrode to prevent substantially the saturation of said display means; and

f. display supply means responsive to the variable voltage applied between said input and output electrodes for applying a selectively variable voltage to said display means such that a substantially constant potential is maintained between said output electrode and said display means.

3,864,596

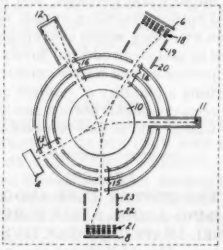
MULTIPLE ELECTRON MIRROR APPARATUS

Kent N. Maffitt, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 18, 1972, Ser. No. 272,778

Int. Cl. H01j *29/52*

U.S. Cl. 315—30 **10 Claims**



1. An electron beam system including

a magnetic prism;

an electron beam source for providing an electron beam and positioned to direct the electron beam to the magnetic prism;

a plurality of electrically biased electron mirrors,

with one positioned to initiallly receive the electron beam from the magnetic prism, said one electron mirror biased to return the electron beam to the magnetic prism and

another of said plurality of electron mirrors positioned to receive the electron beam returned to the magnetic prism by said one electron mirror.

3,864,597

DEVICE FOR INCREASING THE ACCURACY OF ADDRESSING AN ELECTRON BEAM STRIKING A TARGET

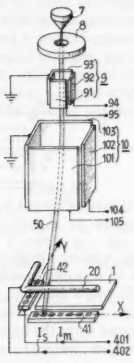
Jacques Trotel, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 13, 1973, Ser. No. 350,719

Claims priority, application France, Apr. 25, 1972, 72.14639

Int. Cl. H01j 29/70

U.S. Cl. 315—31 R 10 Claims



1. A device for increasing the accuracy of addressing an electron beam striking a surface, comprising in an evacuated enclosure a cathode capable of emitting an electron beam in an electric field;

an electron beam deflection system;

an anode consisting of a target surface;

two levelling-rods perpendicular to one another said levelling rods respectively having graduations, said graduations being made of a substance responding to electron impact, in another manner than that of the remainder of the rods; means for detecting the response to said electron impact; means for adressing a predetermined point of said target, by scanning successively in the directions of one rod, and of the other, for impinging upon the corresponding graduation of the rods.

3,864,598

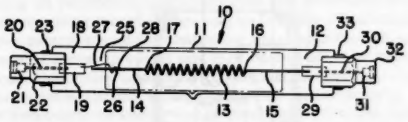
INCANDESCENT LAMP WITH INTERNAL FUSE

John G. Cardwell, Jr., Kirtland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1973, Ser. No. 384,744

Int. Cl. H01k 1/66

U.S. Cl. 315—74 7 Claims



1. An electric incandescent lamp comprising an envelope of vitreous material having at least one pinch seal at one end of the envelope, an incandescible filament of the coiled-coil type made of fine wire connected at one end to a formed spud, said spud having its opposite end sealed in said pinch seal in insulating relationship to a lead-in conductor, and a fuse member electrically connected to the spud at one end and a lead-in conductor at the other end, said fuse member comprising a coiled portion fitted over the formed spud which is sealed in said pinch seal and a leg portion, said leg portion being attached to a foliated section of the lead-in conductor, said filament being unsupported by said fuse member.

3,864,599

GAS DISCHARGE LIGHTING ARRANGEMENT WITH REVERSIBLE ION SUPPLY

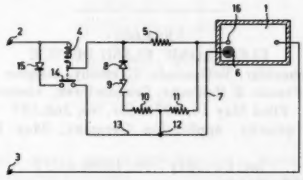
Gustaaf Adolf Wesselink; Richard Bleckrode; Hendrik Roelofs, and Pieter Hendrik Broerse, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1973, Ser. No. 341,987

Claims priority, application Netherlands, Mar. 25, 1972, 7204033

Int. Cl. H01j 17/26

U.S. Cl. 315—109 14 Claims



1. A lighting arrangement comprising an electric discharge lamp including a pair of spaced electrodes defining a discharge space, two input terminals adapted to be connected to a voltage source for supplying the discharge lamp, a reservoir in communication with the lamp discharge space for producing ions of a material participating in the electric discharge in said discharge space and located so that in the operating condition of the lamp the reservoir is substantially exclusively heated by the electric discharge present in the discharge space, means providing an auxiliary direct voltage between the reservoir and the discharge space so that ions produced in the reservoir are transported by means of said auxiliary direct voltage from said reservoir to the discharge space, and means for reversing the polarity of the auxiliary direct voltage so that ions can be withdrawn from the discharge space into the reservoir.

3,864,600

ELECTRONIC FLASH APPARATUS

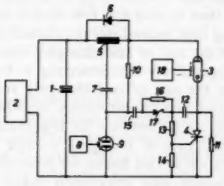
Arthur Schneider, Volkenrode, Germany, assignor to Rollei-Werke Franke & Heidecke, Branschweig, Germany

Continuation-in-part of Ser. No. 307,605, Nov. 17, 1973,. This application Jan. 22, 1974, Ser. No. 435,594

Claims priority, application Germany, Feb. 2, 1973, 2305022

Int. Cl. H05b 41/32

U.S. Cl. 315—241 P 4 Claims



1. Electronic flash apparatus comprising a storage capacitor, a flash tube and a thyristor in series with each other and in parallel with said storage capacitor, ignition means for igniting said flash tube so that current from said storage capac-

itor may flow through said tube to create a flash of photographic light therein, and extinction means for stopping flow of current through said tube to stop emission of light therefrom when sufficient light for the photographic purpose has been produced, said extinction means including an impedance located in the discharge circuit between said storage capacitor and said tube, said impedance having an intermediate tap, a commutating capacitor and an electronic switch connected in series with each other and in parallel with said tube and thyristor through said intermediate tap, a by-pass resistor in parallel with said commutating capacitor and a portion of said impedance, a third capacitor and a potentiometer circuit in series with each other and in parallel with said thyristor, the gate of said thyristor being connected to an intermediate point of said potentiometer circuit, and a circuit connection from a junction between said third capacitor and said potentiometer circuit to a junction between said commutation capacitor and said electronic switch, said circuit connection including diode means and a fourth capacitor in series with each other.

3,864,601

ELECTRONIC FLASH DEVICE

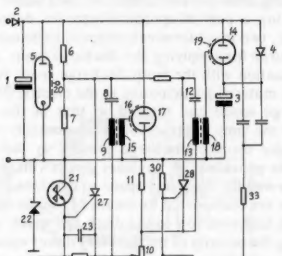
Arthur Schneider, Volkenrode, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed May 14, 1973, Ser. No. 360,197

Claims priority, application Germany, May 19, 1972, 2224443

Int. Cl. G01j 1/16; H05b 41/32

U.S. Cl. 315—241 P **7 Claims**



1. Electronic flash apparatus for photographic purposes comprising flash tube means for generating a light flash, a first storage capacitor for initially powering said flash tube means, a second storage capacitor for supplying additional power when needed to said flash tube means, light sensitive means for deriving a changing voltage the rate of which is a function of the light flash reflected from a subject being photographed, quench means shiftable from an inoperative state to an operative state and effective, when shifted to its operative state, to terminate a flash then in progress, first circuit means for operatively connecting said second storage capacitor to said flash tube means when the rate of said changing voltage is below a given rate and operatively disconnecting it from said flash tube means when the rate of said changing voltage is above said given rate, said first circuit means including an ignition thyristor, an integration capacitor for triggering said ignition thyristor when said rate of changing voltage is below said given rate, integration circuit means for controlling operation of said quench means, said integration circuit means being responsive to light reflected from a subject being photographed and a control thyristor bridging said integration capacitor, said control thyristor having a gate coupled to said means for deriving a changing voltage through a differentiation capacitor, said control thyristor serving to short circuit said integration capacitor when the rate of said changing voltage exceeds a predetermined rate.

3,864,602

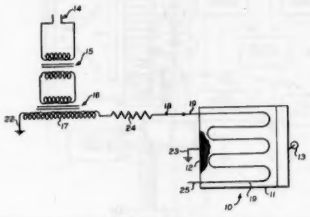
PREVENTING AGGLOMERATION OF PARTICLES DURING SCREENING DUE TO ELECTRICAL EFFECTS

Friedhelm R. Feder, Memphis, Tenn., assignor to Wedco, Inc., Bloomsbury, N.J.

Filed July 24, 1973, Ser. No. 382,250

Int. Cl. H05f 3/00

U.S. Cl. 317—2 R **21 Claims**



1. In the process of screening a mass of particles comprising feeding the particles to a moving screen for the screening thereof, the particles having a tendency to agglomerate during the screening operation due to electrical phenomena so that the screening is interfered with, the improvement for counteracting said tendency which comprises impressing a voltage on an insulated conductor resting directly on the screen during the screening, the voltage being sufficiently high to reduce agglomeration of the particles, but insufficient to cause a glow discharge along the conductor.

3,864,603

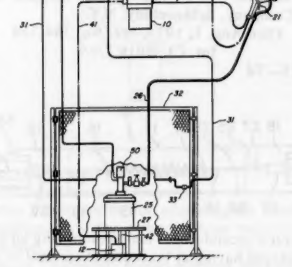
HIGH VOLTAGE SAFETY APPARATUS

David A. Kozinski, Palatine; Bernard W. Siczek, Chicago, and Kenneth L. Carlson, Wheeling, all of Ill., assignors to Graco Inc., Minneapolis, Minn.

Filed Nov. 12, 1973, Ser. No. 415,096

Int. Cl. H02h 3/00

U.S. Cl. 317—9 R **8 Claims**



1. Safety apparatus for confining voltage-charged paint spraying equipment and for discharging components thereof retaining residual voltage charges, comprising:

a. enclosure means for enclosing said voltage-charged equipment, including an access gate for entry and exit;
b. pneumatic alarm means, attached to said enclosure means, for providing a pneumatic signal when said access gate is opened, said pneumatic alarm means including an interruptable pressurized connection at said gate opening point;
c. pneumatic signal receiving means connected to said alarm means for receiving said pneumatic signal indicating an open access gate and for generating a corresponding first voltage signal;
d. a sealed container having therein a spring-biased solenoid, said solenoid having a first solenoid arm position in electrical contact with said components retaining residual voltage charges and a second solenoid arm position displaced from electrical contact, said solenoid being activated by the first voltage signal from said pneumatic signal receiving means, and said solenoid arm being electrically connected to ground potential.

3,864,604

ELECTRICAL SWITCHING DEVICE

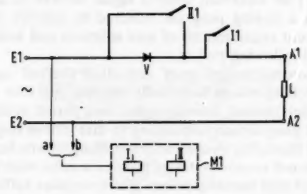
Josef Pfanzelt, Am Neugereuth 10, Freising, Germany

Filed May 8, 1973, Ser. No. 358,267

Claims priority, application Germany, May 8, 1972, 2222517; Aug. 17, 1972, 2240435

Int. Cl. H02h *3/00, 7/00*

U.S. Cl. 317—11 A **20 Claims**



1. A hybrid switching device for connecting a load to an alternating current supply, comprising a half-wave rectifier, a first contactor connected in series with said rectifier between said load and said supply, a second contactor connected in parallel with said rectifier, each of said contactors comprising contacts operable to an open and a closed condition for completing an electrically conductive path and electrically energized operating means for opening and closing said contacts, and a control circuit for controlling the energization of said operating means to switch said load on and off, said control circuit comprising oppositely directed asymmetrically conducting elements and switching elements operable to close said first contactor contacts to connect the load to said rectifier during a half-cycle in which said rectifier is nonconductive and thereafter to close said second contactor contacts during a half-cycle in which said rectifier is conductive thereby applying an input current to said load, and operable to open said second contactor contacts during a half-cycle in which said rectifier is conductive and thereafter to open said first contactor contacts during a half-cycle in which said rectifier is non-conductive thereby removing said input current from said load.

3,864,605

OVERLOAD PROTECTION FOR MINIATURE D-C MOTORS

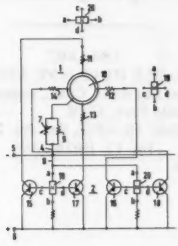
Hans Kuhnlein, Nurnberg-Grossgrundlach, and Helmut Rehahn, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 27, 1973, Ser. No. 428,689

Claims priority, application Germany, Dec. 29, 1972, 2264134

Int. Cl. H02h *7/08*

U.S. Cl. 317—13 R **3 Claims**



1. In a d-c motor system including a d-c motor having a permanent magnet rotor and a Y connected multi-phase stator winding and an electronic commutation device for driving the motor with the return from the motor being a line coupling the common terminal of Y connected stator winding and a voltage terminal, an improved overload protection circuit comprising a resistor having a positive temperature coefficient of resistivity placed in the common lead coupling the phase windings to the voltage terminal.

3,864,606

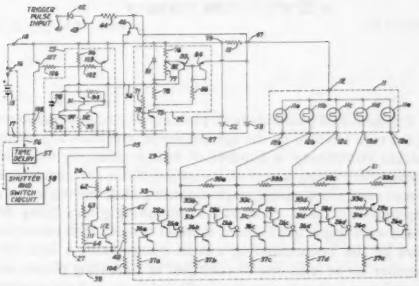
COMPENSATED SEQUENCING CIRCUIT FOR FIRING PHOTOFLASH LAMPS

Donald L. Watrous, Liverpool, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 24, 1972, Ser. No. 299,652

Int. Cl. F23q *7/02*

U.S. Cl. 317—80 **11 Claims**



1. In a circuit for sequentially flashing a plurality of photoflash lamps and comprising a plurality of electrical terminals adapted to be connected respectively to filaments of said flash lamps, a pair of operating voltage terminals, and a sequencing circuit comprising a plurality of semiconductor switch devices connected in circuit paths respectively between said plurality of electrical terminals and one of said operating voltage terminals, said sequencing circuit further comprising a plurality of sequencing circuit stages successively connected from one to another of said semiconductor switch devices, each of said sequencing stages including a semiconductor sequencing de-

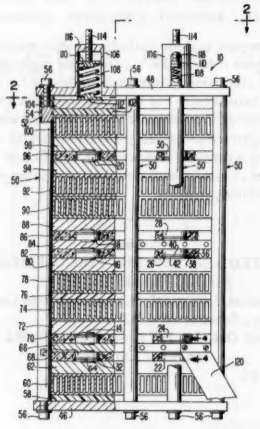
vice the operating characteristics of which are subject to change with changes in operating temperature and voltage, the improvement comprising a temperature and voltage compensator circuit comprising a transistor amplifier including a current feed means, electrical means connecting said amplifier and its current feed means in series in a circuit across said operating voltage terminals thereby causing a compensating voltage to be produced in said current feed means, and electrical means connecting a point of said current feed means that is between said operating voltage terminals to an electrode of at least one of said semiconductor sequencing devices so as to apply said compensating voltage to said sequencing device.

3,864,607

STACKABLE HEAT SINK ASSEMBLY

Edward H. Phillips, Los Altos, Calif., assignor to Programmed Power, Inc., Menlo Park, Calif.

Filed Mar. 16, 1972, Ser. No. 235,188
Int. Cl. H02b *1/00*
U.S. Cl. 317—100 **8 Claims**



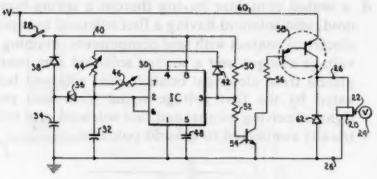
1. A heat sink assembly for a plurality of circuit components of the type enabled by the application of mechanical pressure thereto comprising: a number of heat conducting mounting plates, there being a pair of mounting plates for each circuit component, respectively, each mounting plate having a pair of opposed, flat faces, each pair of mounting plates being disposed with respective faces in thermal contact with respective sides of the corresponding circuit component; a heat sink member for at least one of each pair of mounting plates, said heat sink member having a plurality of open-end air passages therethrough and a working surface in thermal contact with the adjacent face of the corresponding mounting plate, the working surface and the adjacent face having an area greater than the area of the adjacent side of the corresponding component to minimize the thermal impedance between the surface and the face; cage means defining a holder for confining a stack of said circuit components, said mounting plates and said heat sink members, the mounting plates and heat sink members being stackable one-by-one in the holder; and means coupled with the holder for applying a predetermined mechanical pressure simultaneously to the stack of parts held thereby.

3,864,608

COMBINATION MONOSTABLE AND ASTABLE INDUCTOR DRIVER

James M. Normile, Kansas City; Victor M. Mathews, Jr., Leawood, and Eugene Brooks Lilly, Overland Park, all of Kans., assignors to MKC Electronics Corporation, Kansas City, Kans.

Filed May 21, 1973, Ser. No. 361,959
Int. Cl. H01h *47/32*
U.S. Cl. 317—148.5 R **8 Claims**



1. In actuator apparatus employing a solenoid characterized by a relatively high ratio of required pull-in current to required holding current, a driver for operating said solenoid comprising:

supply terminal means connected to said solenoid for supplying the latter with operating potential;

electrically responsive, bistate switching means connected with said terminal means for applying said potential thereto when said switching means is in a first operational state, and for interrupting application of said potential to said terminal means when said switching means is in a second, normal operational state; and

control means coupled with said switching means for delivering an electrical control signal thereto in accordance with a timing program selected to provide the pull-in current requirements of said solenoid and hold the solenoid following pull-in,

said control means upon activation thereof causing said switching means to initially assume said first state for a predetermined, uninterrupted time period at the outset of said program corresponding to said pull-in requirements, and thereafter cycling said switching means between said first and second states to provide a pulse width and spacing at said terminal means which supplies sufficient holding current to the solenoid,

said control signal having first and second levels and said control means delivering said signal at said first level during said time period at the outset of said program and thereafter cycling said signal between said first and second levels to cause said switching means to assume said first and second states thereof respectively in response to said first and second levels of the signal,

said control means including first capacitor means, charging and discharging circuit means connected with said first capacitor means, operating means responsive to predetermined minimum and maximum voltages developed across said first capacitor means for causing the latter to charge via said circuit means when the voltage across said first capacitor means falls to said minimum, and to discharge via said circuit means when said voltage rises to said maximum, and output means for delivering said control signal at said first level during charging of the first capacitor means and at said second level during discharge thereof, whereby said first capacitor means, charging and discharging circuit means, and operating means control said pulse width and spacing at said terminal means to provide a predetermined duty cycle following said uninterrupted time period at the outset of said program,

said control means being provided with second capacitor means of substantial capacitance, and means electrically connecting said second capacitor means with said circuit means during charging operation thereof but electrically

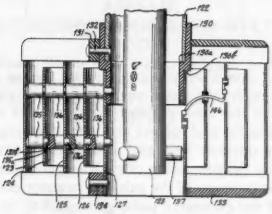
isolating said second capacitor means therefrom during discharging operation of said circuit means, whereby upon said activation of the control means both the first and second capacitor means charge over a time duration terminating when said voltage reaches said maximum, said time duration defining said uninterrupted time period at the outset of said program.

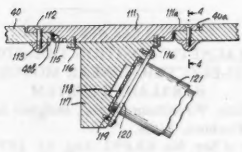
3,864,609

FUEL IMMERSIBLE CAPACITOR FOR MEASUREMENT OF DIELECTRIC CONSTANT OF LIQUID FUEL IN A TANK

Sebastian F. Di Giacomo, Merrick, N.Y., assignor to Gull Airborne Instruments, Inc., Smithtown, N.Y.

Division of Ser. No. 237,718, March 24, 1972, Pat. No. 3,798,515. This application Jan. 2, 1974, Ser. No. 429,896
Int. Cl. H01g 5/01
U.S. Cl. 317—249 R 5 Claims





1. Capacitor means adapted to be immersed in a fluid and to have its capacitance vary with the dielectric constant of the fluid, comprising:

a. a plurality of pairs of concentric cylindrical plates;

b. two terminals;

c. means electrically connecting one set of radially alternate plates together to one terminal;

d. means electrically connecting the other set of radially alternate plates together to the other terminal:

e. said plates being held against relative radial and longitudinal movement by a plurality of radial rows of interfitting insulating radial buttons;

f. each button except the outermost in each row having on its inner end a shoulder encircling a shank received in an aperture in the inner one of the adjacent plates, and having on its outer end a convex surface engaging the inner surface of the outer one of the two adjacent plates, said surface encircling a recess receiving the shank on the next outermost button; and

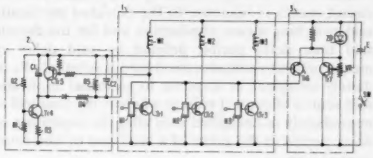
g. the outermost button of the row having a convex surface on its outer end to engage the inner surface of the outermost plate.

3,864,610

SPEED CONTROL DEVICE FOR BRUSHLESS DC MOTOR

Nobuhiko Kawamoto; Tositaka Nakajima, and Tomoyuki Okubo, all of Kawasaki, Japan, assignors to Fuji Electric Company Limited, Kanagawa, Japan

Filed June 28, 1973, Ser. No. 374,435
Claims priority, application Japan, June 30, 1972, 47-65762
Int. Cl. H02k 29/00
U.S. Cl. 318—317 6 Claims



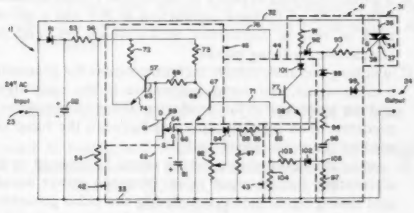
1. A speed control device for a brushless d.c. electric motor including a permanent magnet rotor and a stator having stator winding means energized by a d.c. power supply, comprising switch means for controlling the energizing phase of said stator winding means in response to the rotary position of the rotor, means for detecting the energizing time period of said stator winding means, means for converting the detected period to a corresponding voltage amplitude, means for comparing the converted voltage amplitude with a preset voltage amplitude corresponding to a set speed to produce an error signal for controlling the amplitude of the current in said stator winding means in response to the difference between said converted voltage amplitude and said preset voltage to maintain the motor speed at said set speed.

3,864,611

SOLID STATE CONTROL CIRCUIT FOR INTERMITTENTLY ENERGIZED LOADS

Thomas C. Chang, Irvine, Calif., assignor to Corona Controls, Inc., Corona, Calif.

Filed Oct. 29, 1973, Ser. No. 410,355
Int. Cl. H02h 3/08
U.S. Cl. 318—484 10 Claims



1. In a control system for energizing an electrical load in response to a source of intermittently applied alternating current control voltage, comprising:

a solid state bi-directionally conducting switching means for selectively connecting said source of control voltage to and for energizing said electrical load;

trigger circuit means connected between said source of control voltage and said solid state switching means to repetitively trigger said switching means by said control voltage to its bi-directionally conducting state for energizing said load;

electrical delay circuit means connected to said switching means and being effective after a pre-determined interval of said conduction to provide a time delay period initiated upon termination of said switching means conduction;

sensing circuit means connected to said switching means for detecting termination of said conduction;

trigger disablement circuit means connected to and for selectively disabling said trigger circuit means to prevent triggering of said switching means by said control voltage; and

logic circuit means connected and responsive to said delay circuit means and said sensing circuit means and being connected to and for operating said trigger disablement circuit means in response to the detected termination of said switching means conduction and for the duration of said time delay period defined by said delay circuit means, whereby said electrical load is substantially immediately energized in response to an initial application of said source of control voltage whereas the load will not be immediately re-energized until after the expiration of said delay period in the event of a brief loss of said source of control voltage.

3,864,612

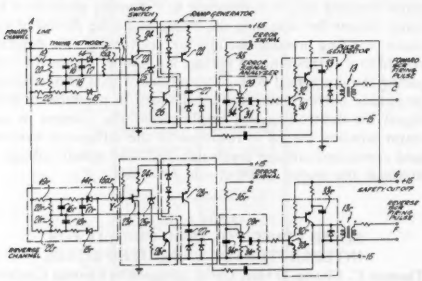
FIRING ANGLE RETARDATION CONTROL

James Sidney Whited, Rt. 3, Box 501, Radford, Va. 24141

Filed Mar. 9, 1973, Ser. No. 339,581

Int. Cl. H02p *5/16*

U.S. Cl. 318—341 **6 Claims**



1. A control system for a D-C motor operable from an alternating current input power supply comprising:

A. a control circuit connected to the power supply and to the motor to provide recitifed power to the motor;

B. a gated rectifying network in the control circuit including a first bank of forward conducting SCR's and a second bank of reverse conducting SCR's which are rendered conductive by firing pulses;

C. a pulse generating system including means for generating a ramp signal, and means responsive to the ramp signal and an error signal for producing firing pulses when a predetermined relationship exists between the ramp signal and the error signal; and

D. means for developing a timing signal referenced to the alternating current input signal from the power supply, said timing signal means coupled to the pulse generating system for regulating the duration of the ramp signal to provide for the generation of firing pulses over an operating range unrestricted by the zero crossover point of the alternating current input signal.

3,864,613

PATH GENERATING SYSTEM FOR NUMERICAL CONTROL APPARATUS

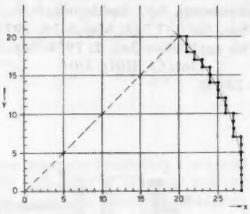
Hymie Cutler, 16230 Santa Rosa, Detroit, Mich. 48221

Filed Dec. 29, 1972, Ser. No. 319,317

Int. Cl. G05b *19/24*

U.S. Cl. 318—573 **7 Claims**

1. Apparatus for generating axis command pulses to be supplied to first and second axis drives to produce a resultant circular movement of a member driven thereby in accordance with a predetermined circular path programmed in a program store, the program store including axes command data and feedrate command data, the apparatus comprising a path generator system operative to generate, in response to the program store axis command data, a train of axes command pulses for each axis to be supplied to the respective drives, and a control system operative to compare the program store feedrate command data with the generated axes command pulses and to produce feed pulses controlling the path generator system; said path generator system comprising: a data register for each of said axes, each register storing the command data for its respective axis from the program store; an



error register; command pulse generating means effective to generate, for each feed pulse, an axis command pulse for said first axis when the error register is of one sign and an axis command pulse for said second axis when the error register is zero or of the opposite sign; and error register control means effective, upon the generation of each axis command pulse, to cause only the contents of the axis data register corresponding to the axis of the command pulse generated to be added into the error register when the error register is of said one sign and to be subtracted from the error register when the error register is of said opposite sign or zero, such as to cause the contents of the error register always to approach zero.

3,864,614

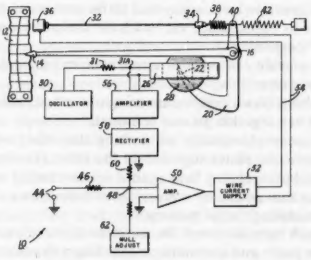
ELECTRO-MAGNETIC POSITION TRANSDUCER FOR A THERMO-ELECTRIC LINEAR MOTOR FORCE REBALANCE SYSTEM

Everett O. Olsen, Wrentham, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Continuation of Ser. No. 63,092, Aug. 12, 1970, abandoned. This application Apr. 27, 1972, Ser. No. 248,286

Int. Cl. G05b *11/01*

U.S. Cl. 318—676 **13 Claims**



1. A positioning transducer comprising magnetic material defining a closed-loop magnetic circuit interrupted at one part of said loop with an air-gap;

an inductive winding magnetically coupled to said closed-loop magnetic circuit to present an inductive impedance responsive to the reluctance of said magnetic circuit;

means producing an a-c current in said winding to develop flux around said magnetic circuit, said flux crossing said air-gap;

a flux-masking element within said air-gap and adapted to be moved in the air-gap by a device the position of which is to be monitored;

said element being characterized by non-magnetic, conductive means occupying a portion of said air-gap and arranged to intercept and alter the net flux crossing said air-gap portion by the development of eddy currents responsive to said flux, so as to alter the net flux around said closed-loop magnetic circuit, said element means being constructed and aranged such that the magnitude of the occupied air-gap portion varies with changes in position of said element and alters the amount of eddy current generated and thereby alters the total amount of said flux crossing said air-gap as said element moves with said device, whereby to change the effective inductance of said winding; and

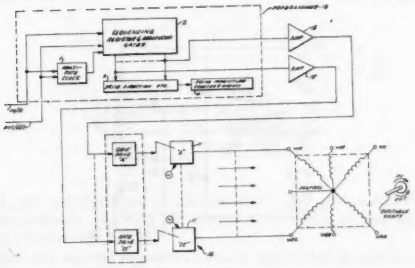
circuit means to produce a signal responsive to the inductance of said winding as determined by the position of said flux-masking element.

3,864,615

ELECTRONIC PROGRAMMER FOR MULTI-PHASE MOTOR

Lee A. Williams, Santa Ana, Calif., assignor to Royal Industries, Inc., Pasadena, Calif.

Filed Sept. 13, 1971, Ser. No. 179,867
Int. Cl. H02k *37/00*
U.S. Cl. 318—696 **14 Claims**



1. In a system having a multi-phase motor having a stator comprising n independently energizable windings arranged in a preselected winding configuration, a rotatable shaft responsive thereto, and a power supply having n triggerable devices for independently supplying single polarity voltage to the independently energizable windings, a programmer for sequencing the operation of the triggerable devices to power the motor for step-by-step movement of the motor shaft,

the programmer including a plurality of binary storage devices arranged to form a register having at least **2n** phase defining states each representative of a different shaft position with a first set of n phase defining states indicating that m triggerable devices should supply voltage to the multi-phase motor and with a second set of n phase defining states indicating the $m + 1$ triggerable devices should supply voltage to the multi-phase motor;

means for sequencing the register through each of the $2n$ states such that each change from an existing state to a changed state results in the changed state being in a different one of the two sets from the existing state;

means responsive to the register for triggering the triggerable devices in accordance with the indication provided by the register; and

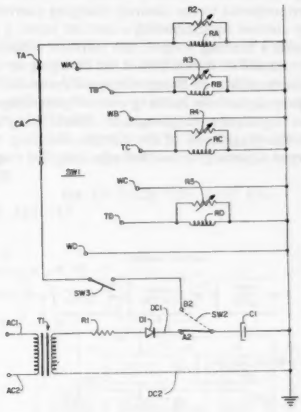
counting means responsive to changes of state by the register for providing an indication of the magnitude of motor shaft movement ordered by the programmer.

3,864,616

COIN-OPERATED CONTROL CIRCUIT FOR SELECTIVELY ENERGIZING A PLURALITY OF MACHINES

John C. Hiortdahl, Rt. 1, Box 185A, Davidsonville, Md. 21035

Filed May 3, 1973, Ser. No. 356,776
Int. Cl. H01h *47/00*
U.S. Cl. 320—1 **7 Claims**



1. A system for energizing a selected load means in a group of load means comprising:

a. capacitor means for storing an amount of electrical energy substantially equal to the energy necessary to energize a single selected load means;

b. first selector switch means for selectively discharging said capacitor means through said selected load means, said switch means including a first set of terminals connected to the respective load means of said group, and movable contact means for selectively engaging a selected one of said terminals in said first set, said contact means being selectively connected in series with said capacitor means;

c. voltage generating means for supplying said capacitor means with said electrical energy; and

d. a second set of terminals interspaced between each of said first set of terminals, said second set of terminals being directly connected to ground, whereby any residual energy in said capacitor remaining after the energization of a selected load means will be discharged to ground when said movable contact engages any of said second set of terminals

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3,864,617

CHARGE CONTROL MEANS FOR MOTIVE POWER BATTERY CHARGER

Howard A. Smith, and William E. Renick, both of Raleigh, N.C., assignors to ESB Incorporated, Philadelphia, Pa.

Filed July 12, 1973, Ser. No. 378,788
Int. Cl. H02j *7/10*
U.S. Cl. 320—23 **6 Claims**

1. In a battery charging device having an input and an output, the input being connectable to a source of power and the output being connectable to a storage battery for supplying a charging current thereto, the improvement which comprises:

a. a voltage reference having an output;

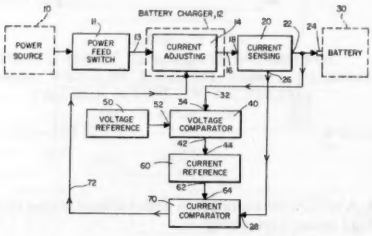
b. a voltage comparator having a first input, a second input and an output, the first input being connected to the output of the voltage reference, the second input being connected to the output of the charging device, the comparator comparing the voltage of the battery with the

voltage of the voltage reference and producing a first reference signal at its output as a result thereof;

c. a current reference having an input and an output, the input being connected to the output of the voltage comparator the current reference supplying to its output a second reference signal whose magnitude is related to the signal received by the input thereof in accordance with a preselected charge program relating a desired battery charging current to the battery voltage, said second signal being proportional to the desired charging current;

d. a charge current sensor having a current input, a current output and a sensing output, the current input thereof being connected to the output of the charging device, the current output thereof being connectable to the battery to be charged, and the sensing output providing a third reference signal, the magnitude of which being proportional to the magnitude of the battery charging current;

e. a current adjusting device for adjusting the magnitude



of the battery charging current, the device having a power input, a power output and a control input, the power input and the power output of the current adjusting device being connected in the charging device so as to provide current thereto, the control input controlling the adjustment of the device; and,

f. a current comparator for supplying a control signal to the current adjusting device, the current comparator having a first input, a second input and an output, the first input being connected to the output of the current reference, the second input being connected to the output of the current sensor, and the output being connected to the current adjusting device, the current comparator comparing the third reference signal received from the current sensor to the second reference signal received from the current reference and supplying the control signal as a result thereof, the control signal causing the third reference signal to continuously equal the second reference signal.

3,864,618

ELECTRO-MECHANICAL VIBRATORY DRIVE CONTROL

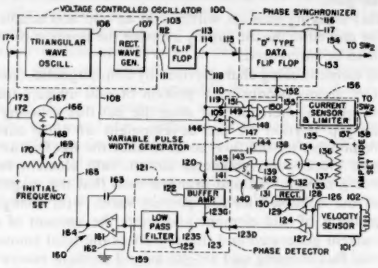
Peter W. Hammond, Chagrin Falls, Ohio, assignor to MEM Controls, Inc., Wickliffe, Ohio

Filed Nov. 13, 1972, Ser. No. 305,982

Int. Cl. H02m *7/00*

U.S. Cl. 321—9 A **20 Claims**

1. A control circuit for providing first and second control signals comprising variable frequency oscillator means for producing first and second output signals at a frequency determined by an input signal thereto, such first and second output signals maintaining substantially constant phase relation, and such first output signal also forming one of the control signals, and variable pulse width generator means for producing from



such first and second output signals and a reference input signal the other one of the control signals.

3,864,619

DC TO AC INVERTER WITH THYRISTOR FOR ISOLATING LOAD CIRCUIT FROM COMMUTING REACTOR

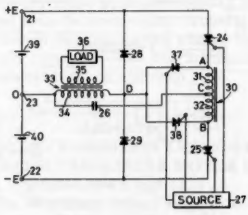
Shinya Tanaka; Mantaro Nakamura, and Kazuo Hirose, all of Niiza, Japan, assignors to Sanken Electric Company Limited, Saitama-ken, Japan

Filed Oct. 29, 1973, Ser. No. 410,514

Claims priority, application Japan, Nov. 14, 1972, 47-114085

Int. Cl. H02m *7/52*

U.S. Cl. 321—16 **10 Claims**



1. An inverter circuit for DC to AC conversion comprising, in combination:

a DC supply system having positive, neutral, and negative terminals;

a commuting reactor having a winding connected across said positive and negative terminals of said DC supply system, said winding of said commuting reactor being center tapped to be substantially divided into first and second halves;

a first thyristor connected between said positive terminal of said DC supply system and said first half of the commuting reactor winding so as to permit current flow from the former to the latter when conductive;

a second thyristor connected between said second half of said commuting reactor winding and said negative terminal of said DC supply system so as to permit current flow from the former to the latter when conductive;

a load circuit having first and second terminals, said first terminal of said load circuit being connected to said neutral terminal of said DC supply system;

a third thyristor connected between said first thyristor and said second terminal of said load circuit so as to permit current flow from the former to the latter when conductive;

a fourth thyristor connected between said second terminal of said load circuit and said second thyristor so as to

permit current flow from the former to the latter when conductive;

a capacitor connected between the center tap terminal of said commuting reactor winding and said first terminal of said load circuit;

a first diode connected substantially in parallel with said first thyristor, the direction of current flow through said first diode being opposed to that through said first thyristor;

a second diode connected substantially in parallel with said second thyristor, the direction of current flow through said second diode being opposed to that through said second thyristor; and

a source of gate signals connected to the gate electrodes of said first, second, third and fourth thyristors;

whereby a voltage of positive polarity is delivered to said load circuit when said first and third thyristors are gated conductive, and a voltage of negative polarity is delivered to said load circuit when said second and fourth thyristors are gated conductive.

3,864,620

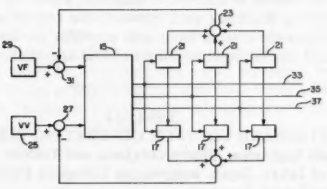
ARRANGEMENT OF PARALLEL STATIC AC POWER SOURCES PROPORTIONS

Alberto Abbondanti, Penn Hills, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 11, 1973, Ser. No. 396,161

Int. Cl. H02m *5/00*

U.S. Cl. 321—27 R **8 Claims**



1. An arrangement of parallel static AC power sources autonomously assuming the proper proportions of load current comprising:

first and second converter circuits connected in parallel;

first current sensing means to produce a signal representative of the output load current of said first converter;

first phasing means responsive to the signal from said first current sensing means to produce a first control signal representative of a first component of the load current of said first converter and a second control signal representative of a second component of the load current of said first converter, said second signal component being in quadrature with said first component;

first control means comprising a voltage reference source, a voltage summing node and an error amplifier, said voltage reference source providing a voltage reference signal, said voltage reference signal and said first control signal being applied to said voltage summing node, said error amplifier controlling the voltage amplitude of said first converter in response to the difference between the output of said voltage summing node and a similarly scaled representation of the amplitude of the output voltage of said first converter, said first control means being responsive to said first control signal produced by said first phasing means to control the amplitude of the voltage of said first converter in such a fashion as to cause said first proportion converter to tend to supply a constant predetermined proportion of the total load current;

second control means responsive to said second control signal produced by said first phasing means to control the frequency of the voltage of said first converter in such a fashion as to cause said first converter to tend to supply a constant predetermined proportion of the total load current; and

an external input to said voltage summing node to adjust the amplitude of the voltage of said first converter in proportion to a similar adjustment in the amplitude of the voltage of said second converter.

3,864,621

TRANSISTORIZED CONTROL CIRCUIT FOR MAGNETO MOTOR IGNITION SYSTEMS

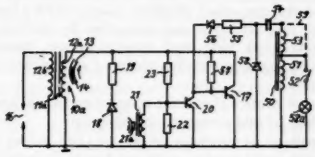
Georg Haubner, Berg; Walter Hofer, Schwabach, and Peter Schmaldienst, Nurnberg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed July 31, 1973, Ser. No. 384,380

Claims priority, application Germany, Aug. 29, 1972, 2242326

Int. Cl. F02p *1/00, 1/08, 9/00*

U.S. Cl. 322—17 **6 Claims**



1. In an internal combustion engine ignition system having a magneto generator with a magneto armature provided with at least one winding arranged to be excited by a magnetized rotor driven by the engine, and having voltage step-up means coupled with said magneto armature, which means is coupled with a low-voltage winding of said armature and connected by ignition cable to at least one spark plug, said ignition system having also a spark-timing pulse generator operated in synchronism with said engine,

an ignition control circuit for connection to said low-voltage winding of said armature, comprising:

a controllable semiconductor device (**17**) having its switching path in circuit with said low-voltage winding;

means to supply the output of said pulse generator (**27**) to the control electrode of said semiconductor device (**17**);

control winding means (**24, 30, 53, 60***b*) for electromagnetically deriving from electrical power supplied by said magneto generator, a voltage to supply control path current to said semiconductor device (**17**) during those half cycles of the output of said magneto armature for which said semiconductor device (**17**) is poled favorably for conduction, said control winding means having one end connected to the circuit in which said low-voltage winding is connected and being subject to a changing magnetic flux during the rise of current in said circuit;

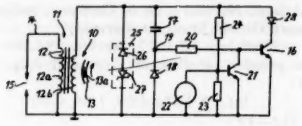
resistance means (**15**) and at least one capacitor (**54**) connected in series between the other end of said control winding means and said control electrode of said semiconductor device (**17**); and

a diode (**58**) having its anode connected to the side of said circuit grounded to the casing of said engine and its cathode connected to the junction of said resistance means (**55**) and said capacitor (**54**).

3,864,622
TRANSISTORIZED CONTROL CIRCUIT FOR MAGNETO MOTOR IGNITION SYSTEMS

George Haubner, Berg; Walter Hofer, Schwabach, and Peter Schmaldienst, Nurnberg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed July 31, 1973, Ser. No. 384,381
Claims priority, application Germany, Aug. 29, 1972, 2242327
Int. Cl. F02p 1/00, 1/08, 9/00
U.S. Cl. 322—17 9 Claims



1. In an internal combustion engine ignition system having a magneto armature provided with at least one winding arranged to be excited by a magnetized rotor driven by the engine, and having voltage step-up means coupled with said magneto armature, which means is coupled with a low-voltage winding of said armature and connected by ignition cable to at least one spark plug, said ignition system having also a spark-timing pulse generator operated in synchronism with said engine,

an ignition control circuit for connection to said low-voltage winding of said armature, comprising:

a controllable semiconductor device (16) having a switching path and a control path and having its switching path in circuit with said low-voltage winding and its control path in a control circuit;

means (21) to supply the spark-timing pulse output of said pulse generator (22) to the control circuit of said semiconductor device (16) in such polarity as to put the switching path of said semiconductor device quickly into its non-conducting condition and thereby interrupt the current in said low-voltage winding;

a series combination of a capacitor (17) and a diode (18) connected so as to bridge at least a substantial part of said low-voltage winding (12b), said diode being poled for conduction in the direction opposite to the direction of conduction of said switching path of said semiconductor device (16), and

a resistively conductive connection between said control electrode of said semiconductor device (16) and the common connection (19) of said capacitor (17) and said diode (18).

3,864,623
PSEUDO BALANCED CONSTANT CURRENT SUPPLY

David W. Luce, Pacific Palasades, Calif., assignor to Computer Transmission Corporation, El Segundo, Calif.

Filed Oct. 5, 1973, Ser. No. 403,998
Int. Cl. G05f 1/46
U.S. Cl. 323—1 3 Claims

1. Current supply circuit for a pair of line conductors comprising:

a voltage supply;

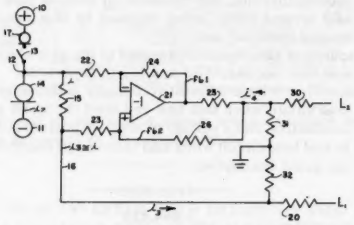
said voltage supply comprising a negative polarity constant current source and a positive polarity constant current source and switch means for selectively applying one or both of said constant current sources to a common output terminal of said voltage supply;

a pair of line conductors;

a first resistance connected in series between the said output terminal of said supply and the first of said pair of line conductors;

an amplifier having a gain of substantially minus one and a pair of input terminals;

means connecting the input terminals of said amplifier to the opposite ends of said first resistance whereby the input voltage to said amplifier is a voltage drop proportional to the current in the first of said pair of line conductors;



a first feedback path from the output of said amplifier to one of said pair of input terminals;

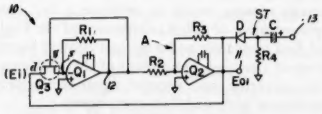
a second resistance equal in value to said first resistance and connected in series with the output of said amplifier and the second of said line conductors; and

a second feedback path between the end of said second resistance remote from said amplifier to the second of said pair of input terminals of said amplifier.

3,864,624
STANDARD VOLTAGE GENERATING CIRCUIT

Takashi Sugiyama; Minoru Odajima, and Yoshiro Tamezumi, all of Tokyo, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed May 24, 1973, Ser. No. 363,477
Claims priority, application Japan, May 31, 1972, 47-53924; May 31, 1972, 47-53925
Int. Cl. G05f 1/56; H03f 1/14
U.S. Cl. 323—19 19 Claims



1. A circuit for generating a highly stable and accurate standard DC voltage comprising:

an operational amplifier having an input and an output;

a negative feedback circuit between the operational amplifier output and input and having a constant gain;

a positive feedback circuit extending between the operational amplifier output and input; and

means in the positive feedback circuit for limiting the current passing therethrough to the operational amplifier input to a constant stable level, the current limiting means having a condition of operation in which current remains constant despite variations in voltage thereacross, the current limiting means being arranged to operate in said constant current condition at said stable current level;

thereby to produce a stable DC output voltage at the output of the operational amplifier.

3,864,625

METHOD AND A DEVICE FOR MEASURING THE THICKNESS OF THE WALL OF A TUBE OF NON-CONDUCTING MATERIAL LEAVING AN EXTRUDER NOZZLE

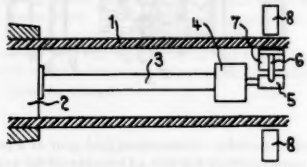
Bruno Zumbach, Orpund, and Peter Nopper, Lyss, both of Switzerland, assignors to Zumbach Electronic Automatic, Canton, Berne, Switzerland

Filed Dec. 12, 1972, Ser. No. 314,334

Claims priority, application Switzerland, Dec. 13, 1971, 18201/71

Int. Cl. G01r *33/00*

U.S. Cl. 324—34 TK **21 Claims**



1. A method of measuring the wall thickness of a tube of non-conductive material leaving an extruder nozzle, including the steps of locating an electrically conductive article inside the tube, approaching to and maintaining a measuring device at a predetermined distance from the outer surface of the tube for measurement of the distance between said article and said measuring device, providing means for producing a relative movement between said measuring device and the article such that the distance between them passes through a minimum with said article in a defined position relatively to the inner surface of the tube, detecting the value measured by said measuring device at this minimum, said value being a measure for the tube thickness where said article is located within the tube during detection of said value.

3,864,626

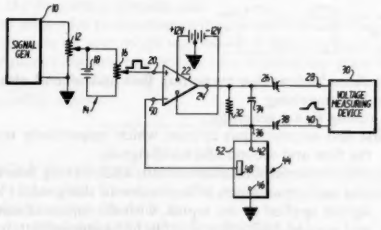
METHOD AND APPARATUS FOR EVALUATING PROPERTIES OF MATERIALS

Alexander F. MacLean, Durham, N.H., and Ilmar L. Kalnin, Millington, N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 26, 1973, Ser. No. 326,711

Int. Cl. G01r *27/26*

U.S. Cl. 324—61 R **21 Claims**



10. A method for determining a relative physical property of a fiber comprising the steps of:

a. sensing the capacitance of a capacitive cell having two electrodes and having a reference fiber of known physical properties as one of the electrodes;

b. sensing the capacitance of said capacitive cell having a second fiber of unknown physical properties as said one of the electrodes; and

c. evaluating an unknown physical property of the second fiber relative to a known physical property of the reference fiber as a function of the two sensed capacitances.

3,864,627

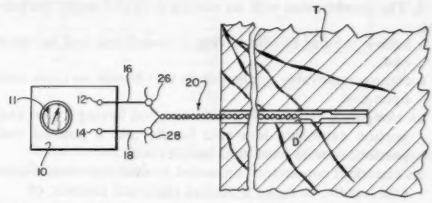
PROBING FOR DETECTION OF DECAY IN WOOD

Alex Shigo, Mifflin, Pa., assignor to Northeast Electronic Corporation, Concord, N.H.

Filed Dec. 3, 1973, Ser. No. 420,932

Int. Cl. G01r *27/02*

U.S. Cl. 324—65 P **10 Claims**



1. Probing apparatus for measuring cation concentration in wood structure comprising,

means including first and second insulatedly separated wires defining a probing element for establishing a portion of a current path in the interior of wood,

the probing element defining means comprising means forming an axially elongated insertable end thereof with spaced points thereon for conductive contact with internal walls of said wood,

said means defining an insertable end being yieldable to within a first compressed geometric cross-section envelope for insertion through narrow internal passages within the wood and expandable to positively contact internal walls of the wood when measuring,

means defining a flexible, stiff major length portion of the probing element,

and means for essentially insulating said wires from the wood except in the region of said spaced points.

3,864,628

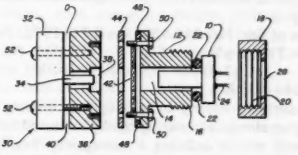
SELECTIVE SOLID-STATE GAS SENSORS AND METHOD

Donald L. Klass, Barrington, and Carl D. Landahl, Chicago, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed May 29, 1973, Ser. No. 364,755

Int. Cl. G01n *27/00*

U.S. Cl. 324—71 SN **15 Claims**



1. A method for detecting a selected gas with a solid state gas sensor present in an electric circuit with output detection means, including the steps of

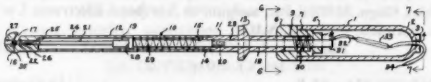
exposing said gas sensor to gases, including the selected gas, only through a gas permeable membrane which is highly selective for permeating said selected gas, and

determining the characteristic time response lag of said sensor to said selected gas by actuation of the circuit detection means.

3,864,629
ELECTRICAL CIRCUIT TESTER

Patrick Danna, 1303 Kingsbury, Dearborn, Mich. 48121

Filed Mar. 23, 1973, Ser. No. 344,187
Int. Cl. G01r 31/02
U.S. Cl. 324—72.5 5 Claims



1. The combination with an electrical circuit tester, including

a hollow tubular handle having a closed end and an open end,

a closure removably applicable to said handle to close said open end,

an elongated, electrically conductive rod having a near end portion extending into said handle and a pointed end portion, remote from said handle, and

an electrical conductor connected to said near end, within said handle, to make a desired electrical contact, of

an elongated, tubular sleeve having an interior elongated slideway extending its full length,

a recess in the outer end portion of said sleeve, formed to intersect said slideway, and receive an electrically conductive wire disposed transverse to and in the path of said slideway,

said sleeve having a normal position in which its outer end substantially coincides with and encompasses said pointed end, so that said pointed end obstructs said recess,

said sleeve having reciprocable, sliding travel longitudinally of said rod, toward said handle to a retracted position exposing said pointed end for desired, selective electrical contact, or away from said handle to an extended position, to withdraw said recess from said pointed end, whereby said recess may receive a wire for physical and electrical contact by said pointed end upon reversal of said sliding travel, toward said normal position of said sleeve,

a first yieldably resistance means reacting between said rod and said sleeve to urge said sleeve toward said retracted position, and

a second yieldably resistance means reacting between said closure and said sleeve to urge said sleeve toward said extended position,

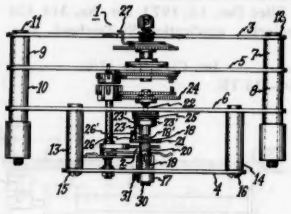
said first and second means resistance, jointly establishing said sleeve in said normal position.

3,864,630
SELF-ALIGNING BEARING ASSEMBLY

Donald M. Ham, Rochester, N.H., assignor to General Electric Company

Division of Ser. No. 246,458, April 21, 1972, Pat. No. 3,789,300. This application Sept. 4, 1973, Ser. No. 393,971
Int. Cl. G01r 19/16; F16c 23/00
U.S. Cl. 324—103 R 6 Claims

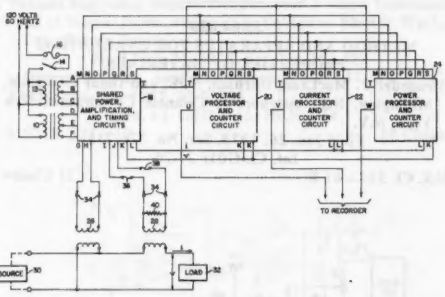
1. An assembly having a self-aligning bearing assembly comprising an elongated bearing rigidly mounted on a support member, wall means defining a passageway axially through said bearing, said wall means being formed to include a lip portion that defines a minimum diameter orifice in said passageway, a bushing sleeve positioned through said orifice, a plurality of bosses formed on said bushing sleeve, said bushing sleeve having a flange formed on one end thereof, and including a gear rotatably mounted on the outer surface of said bushing sleeve between said flange and said bosses, said flange being effective to maintain the gear on said sleeve, each of said bosses being in "force fit" engagement with the lip portion of said passageway thereby to prevent the sleeve from rotating with respect to the bearing, means defining a shaft-receiving aperture through said bearing sleeve in which a shaft can be rotatably mounted, said bushing sleeve being operable to pivot about the points of engagement between said bosses and the lip portion of said passageway thereby to enable the shaft-receiving aperture in said bushing sleeve to be easily moved into alignment with a shaft inserted into it, and including a pusher member mounted on said gear at a point spaced radially outward from the axis of rotation of the gear, and also including a shaft rotatably mounted in said bushing sleeve, said shaft having a lever arm affixed to it for rotation therewith, said lever arm being operable to be engaged by said pusher member and to be rotated in response to rotation of the pusher member when engaged thereby.



3,864,631
ELECTRONIC MULTIMETER HAVING A PLURALITY OF VOLTAGE-TO-FREQUENCY CONVERTERS

William E. Zitelli, Media, and Andras I. Szabo, Export, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 16, 1974, Ser. No. 461,333
Int. Cl. G01r 15/08, 17/06
U.S. Cl. 324—115 5 Claims



1. A multimeter for measuring first and second electrical signals, comprising:

a timing signal generator;

first and second input circuits which respectively transfer the first and second electrical signals;

first and second multiplier circuits each having two inputs and an output which is responsive to the product of the signals applied to the inputs, with the inputs of said first and second multiplier circuits being appropriately coupled to the first and second input circuits to provide the desired output products;

a first voltage-to-frequency converter connected to the output of said first multiplier circuit and to said timing signal generator, said converter providing output pulses proportional in number to the output from said first multiplier circuit;

a first programmable electronic dividing circuit connected to said first voltage-to-frequency converter, said dividing

circuit providing one output pulse when the output pulse from said voltage-to-frequency converter occurs a predetermined number of times;

first counter and first display means which furnish an indication of the number of output pulses provided by the dividing circuit;

a second voltage-to-frequency converter connected to the output of said second multiplier circuit and to said timing signal generator, said converter providing output pulses proportional in number to the output from said second multiplier circuit;

a second programmable electronic dividing circuit connected to said second voltage-to-frequency converter, said dividing circuit providing one output pulse when the output pulse from said voltage-to-frequency converter occurs a predetermined number of times; and,

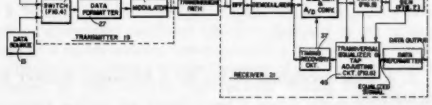
second counter and second display means which furnish an indication of the number of output pulses provided by the second dividing circuit.

3,864,632

FAST EQUALIZATION SYSTEM

Tien-Lin Chang, Orange, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 1, 1973, Ser. No. 402,424
Int. Cl. H04b 1/10
U.S. Cl. 325—42 **11 Claims**



1. An equalization system for automatically adjusting the tap settings of a transversal equalizer to correct for distortions of a data signal received from a transmission channel, said system comprising:

first means responsive to a first signal in the time domain from the transmission channel for developing time domain samples of the first signal;

second means for performing a discrete fast Fourier transform on the time domain samples of the first signal to develop samples in the frequency domain;

third means for developing reciprocal values of the samples in the frequency domain; and

fourth means for performing an inverse discrete fast Fourier transform on said reciprocal values of the samples in the frequency domain to develop time domain tap gains for automatically adjusting the tap settings in the transversal equalizer circuit

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3,864,633

ANGLE DIVERSITY COMMUNICATION SYSTEM

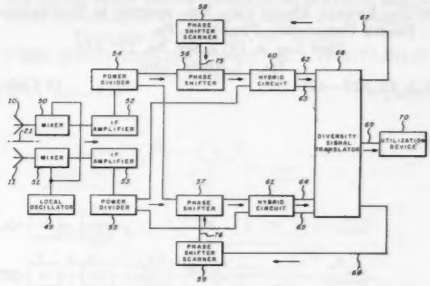
Harry F. Strenglein, Clearwater, Fla., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 23, 1972, Ser. No. 283,242
Int. Cl. H04b 1/10, 7/02
U.S. Cl. 325—304 **15 Claims**

3. Apparatus as described in claim 1 further including between said sum output port means and said diversity signal translator means and between said difference output port means and said diversity signal translator means respective first and second substantially simila. ignal converter means each comprising in series relation:

mixer means for forming an intermediate frequency signal, and

detector means for detecting said intermediate frequency signal for providing an output signal substantially proportional in amplitude to the amplitude of said intermediate frequency signal.

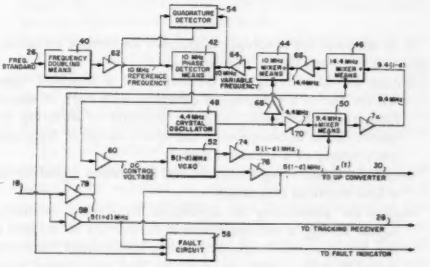


3,864,634

DOPPLER CORRECTION CIRCUIT

Philip G. Dragonetti, Largo, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 1, 1973, Ser. No. 411,615
Int. Cl. H04b 1/16
U.S. Cl. 325—419 **4 Claims**



1. A circuit for correcting Doppler shift in a transmitted signal for use with a tracking receiver providing an output signal containing positive Doppler information comprising, in combination: 'phase-lock-loop means comprising phase-detector means, loop amplifier means, voltage-controlled oscillator means (VCO) and mixer means, all being connected in said loop in the order named and receiving as an input the output of the preceding means in said loop;

frequency standard means the output of which is connected as an input to said phase-detector means; and

oscillator means connected to supply one input signal to said mixer means,

said positive Doppler signal being fed to said mixer means as a third input, the output of said mixer means being a signal having minute Doppler content corresponding to the Doppler shift in the output of the tracking receiver, the output of the mixer means being compared in phase by said phase-detector means to the output of said frequency standard means and the phase difference being detected to provide a control signal which is amplified by the loop amplifier and used to control the operation of the VCO,

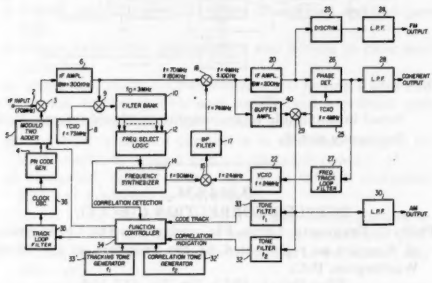
the output of the VCO being a signal containing the positive Doppler information in inverted form.

3,864,635

CORRELATION RECEIVER WITH RAPID FREQUENCY, TIME AND PHASE ACQUISITION

Walter Ewanus, Ellicott City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 4, 1972, Ser. No. 277,938
Int. Cl. H04b 15/00
U.S. Cl. 325—421 18 Claims



1. A receiver for resolving frequency and phase uncertainties of a received signal, comprising

means for identifying the frequency of a received signal within one of a plurality of differing slots each of limited frequency uncertainty and the plurality of differing frequency slots encompassing the entire range of frequency uncertainty of a received signal,

means for generating a synthesized frequency signal having a first nominal frequency

means for generating an adjustable frequency oscillation signal having a second nominal frequency so related to the first nominal frequency of the synthesized frequency signal that the combination of the first and second nominal frequencies corresponds to a third nominal frequency differing from the frequency of the received signal by a desired IF value,

said synthesized frequency generating means being responsive to said frequency identification means to generate said synthesized frequency signal at a frequency value, relative to said first nominal frequency, which corresponds to the frequency slot identification of said received signal.

means for mixing the adjustable frequency oscillation signal and the synthesized frequency signal to produce a combined signal having said third nominal frequency,

means for mixing the combined signal with the received signal to convert the received signal to an IF signal having a nominal frequency of the desired IF value,

means for producing a reference oscillation signal at the said desired IF value,

phase detection means responsive to the IF signal and the reference oscillation signal to detect and produce an output representing any difference in phase therebetween and

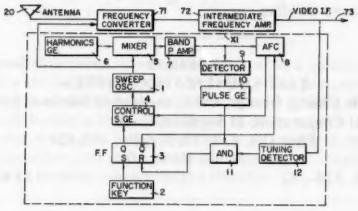
said adjustable frequency oscillation signal generating means is responsive to the output of said phase detection means to adjust the frequency of said adjustable frequency oscillation signal generated thereby, to achieve phase acquisition of the received signal

3,864,636

LOCAL OSCILLATION DEVICE FOR A TELEVISION RECEIVER SET

Takeo Fukuda, Yokohama; Kenichi Torii, Tokyo, and Kazuo Nishibayashi, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Mar. 20, 1973, Ser. No. 343,100
Claims priority, application Japan, Nov. 9, 1972, 47-112419; Nov. 9, 1972, 47-112420
Int. Cl. H03b 3/08
U.S. Cl. 325—421 13 Claims



1. A local oscillation device for a television receiver set comprising:

a harmonics generator for producing simultaneously a plurality of frequency spectra having a frequency separation equal to the frequency separation among a plurality of channels, the frequency of each spectrum being an integral multiple of said separation frequency;

a sweeping oscillator for initiating its sweep in response to a start-of-sweep signal and varying its oscillation frequency;

means for supplying the output frequency from said sweeping oscillator to a frequency converter which mixes said output frequency with a television broadcasting wave frequency to obtain a predetermined video intermediate frequency, said output frequency to be supplied to the frequency convertor at a tuning condition not an integral multiple of said separation frequency;

a mixer coupled to said harmonics generator and said sweeping oscillator for obtaining beat signals produced between the frequency of said harmonics and the frequency of said sweep generator;

a band pass filter coupled to said mixer for deriving beat signals from said mixer when a predetermined frequency difference exists between the output frequency of said harmonics generator and the output frequency of the sweeping oscillator;

means coupled to said band pass filter for deriving marker signals corresponding to the respective channel positions from the output of said band pass filter;

key means coupled to said sweep oscillator through a control means for producing said start-of-sweep signal;

means for selecting a desired channel with the aid of said marker signals after the start-of-sweep and for stopping the sweep through said control means; and

an automatic frequency control (AFC) circuit for maintaining the output frequency of said sweeping oscillator constant after the stop-of-sweep.

3,864,637
FREQUENCY REGULATION OF VOLTAGE CONTROLLED OSCILLATORS USING CLOCK-DRIVEN DIGITAL COUNTERS

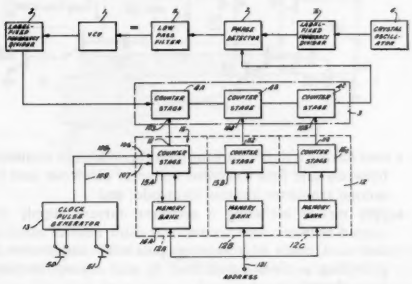
Willy Kanow, Berlin, Germany, assignor to Loew Opta GmbH, Berlin, Germany

Filed Mar. 7, 1973, Ser. No. 338,986

Claims priority, application Germany, Mar. 10, 1972, 2211664

Int. Cl. H04b *1/32*

U.S. Cl. 325—470 **7 Claims**



5. In an apparatus for regulating the output frequency of a voltage controlled oscillator which is disposed in the tuning stage of a signal-seeking communications receiver and which is adjustable to sweep a selected portion of the frequency band received by the receiver, the receiver having facilities for detecting within the swept band a signal whose amplitude exceeds a predetermined threshold, wherein the apparatus includes a first programmable digital counter having N successively higher order cascaded stages each of which has an auxiliary S-bit parallel input responsive to digital command signals for individually adjusting the count of such stage, the output frequency of the oscillator being divided by a factor proportional to the total count of the first counter; and wherein the output frequency of the oscillator is adjusted by an error signal derived from a comparison of the divided frequency and a reference frequency, an improved arrangement for successively varying the instantaneous count of the first counter to sweep the frequency band and for terminating the sweep upon the detection of a signal having an amplitude above the threshold, which comprises:

a second digital counter having N cascaded stages, each such stage including an auxiliary S-bit parallel output representative of the instantaneous count of such stage; a normally unoperated clock pulse generator;

first means for coupling the output of the clock pulse generator to the counting input of the lowest order stage of the second counter;

second means for individually coupling the auxiliary outputs of each stage of the second counter to the auxiliary inputs of the corresponding stages of the first counter to sweep a desired portion of the frequency band when the clock pulse generator is operated;

normally deenergized switching means having a first input energizable to operate the clock pulse generated and to initiate the sweep of the frequency band and a second input energizable to disable the clock pulse generator to terminate the sweep; and

means responsive to the reception of a signal having an amplitude above the threshhold for energizing the second input of the switching means.

3,864,638
HIGH SPEED PHASE METER

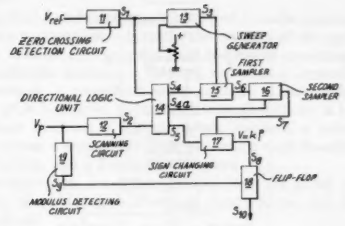
Bernard Audenard, Seclin; Michel Pigeon, Bures-Sur-Yvette, and Claude Stach, Faches-Thomesnil, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed July 24, 1973, Ser. No. 382,053

Claims priority, application France, Aug. 3, 1972, 72.28120

Int. Cl. H03b *3/04*

U.S. Cl. 328—134 **8 Claims**



1. A high-speed phase meter essentially comprising:

a reference signal source, a source of a signal to be scanned, a sweep waveform generator connected to said reference source controlled by the shaped reference signal, (V ref) a first and a second memory sampler connected to said generator which sample said sweep waveform,

a directional logic unit connected to said sources and to said samplers controlled by the reference signal and the shaped signal to be scanned (Vϕ) which delivers two signals for controlling said samplers and a logical signal for the direction of the phase shift,

a sign-changing circuit connected to said logic circuit and to said second sampler controlled by said directional logic unit and by said second sampler so as to deliver an analog signal ($V = \pm k\phi$) which is representative of the value and sign of the phase shift after transition through a sinusoidal cycle between the reference signal (V ref) and the signal (Vϕ) to be scanned,

a modulus detecting circuit connected to said source of signal to be scanned, an analog gate connected to said sign-changing circuit and to said modulus detecting circuit controlled by said analog signal and by a signal from said modulus detecting circuit for controlling the peak of the modulus of the signal to be scanned in order to block the output signal when the modulus is smaller than a predetermined value.

3,864,639
FREQUENCY CONTROL CIRCUITS

Gerald Musgrave, Tong Park Baildon, and Alan Michael Hayes, Shipley, both of England, assignors to George Kent Limited, Luton, Bedfordshire, England

Filed Feb. 20, 1973, Ser. No. 333,711

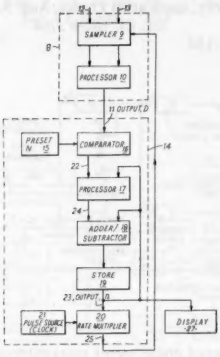
Claims priority, application Great Britain, Feb. 24, 1972, 8643/72

Int. Cl. H03k *5/00*

U.S. Cl. 328—151 **9 Claims**

1. A sampling frequency control circuit for controlling the frequency at which an input signal is sampled by apparatus for sampling and processing data, comprising means for providing a pre-set signal representative of a desired value of output signal from the sampling and processing apparatus, comparator means for comparing and providing an output signal dependent upon the relationship between the pre-set signal and the output signal of the sampling and processing apparatus, frequency correction means supplied with and adapted to employ the output signal of the comparator means and a signal dependent upon the sampling frequency so as to provide an output signal representative of a corrected sampling fre-

quency, signal generating means supplied with the output signal of the frequency correction means and adapted thereby to generate an output signal dependent upon a corrected value of sampling frequency and means for supplying the output



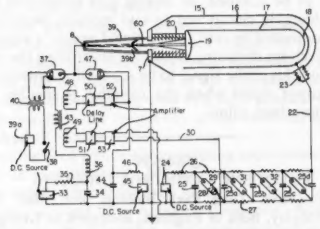
signal of the signal generating means to the sampling and processing apparatus thereby to adjust the sampling frequency to a value as to bring the output signal of the sampling and processing apparatus into correspondence with the pre-set signal.

3,864,640

CONCENTRATION AND GUIDANCE OF INTENSE RELATIVISTIC ELECTRON BEAMS

Willard H. Bennett, 605 Appleton Dr., Apt. B., Raleigh, N.C. 27606

Filed Nov. 13, 1972, Ser. No. 306,246
Int. Cl. H01j *29/58*
U.S. Cl. 328—228 **7 Claims**



1. An electron beam apparatus comprising
a. electron beam producing means for concentrating an electron beam discharge having a self-magnetic field,
b. guide pinch means for directing and confining said discharge,
c. means for actuating said discharge.

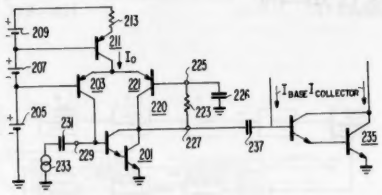
3,864,641

HIGH-INPUT-IMPEDANCE AMPLIFIER

Adel Abdel Aziz Ahmed, Clinton Township, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 2, 1973, Ser. No. 320,633
Int. Cl. H03f *3/18*
U.S. Cl. 330—17 **39 Claims**

1. An amplifier comprising, in combination:
first and second transistors of complementary conductior types each having base, emitter and collector electrodes, said first transistor being a bipolar type and having its emitter electrode direct current conductively coupled to a point of reference potential, said second transistor collector electrode being direct current conductively connected to said first transistor base electrode;
means for applying an input signal to said first transistor base electrode;



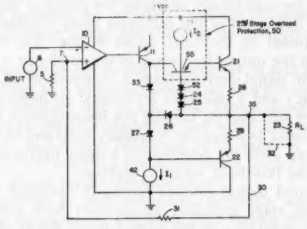
a load having a direct current path therethrough connected between said first transistor collector electrode and said second transistor emitter electrode; and
supply means including a constant current supply connected between said second transistor emitter electrode and said point of reference potential, and means for providing a biasing potential to said second transistor base electrode.

3,864,642

SECOND STAGE OVERLOAD PROTECTION FOR AMPLIFIERS

Ernest L. Long, Tempe; Ronald W. Russell, Mesa, and James E. Solomon, Scottsdale, all of Ariz., assignors to Motorola Inc., Franklin Park, Ill.

Continuation of Ser. No. 111,454, Feb. 1, 1971, abandoned.
This application Apr. 13, 1973, Ser. No. 351,047
Int. Cl. H03f *21/00*
U.S. Cl. 330—207 P **7 Claims**



1. In an amplifier circuit including a gain stage connected to a supplemental amplification stage, an output stage having an output transistor and an output terminal, said output transistor having a base and an emitter, said amplifier circuit having feedback means coupled between said output stage and said gain stage, said supplemental amplification stage having an input transistor having a collector, an overload protection circuit comprising:
switchable resistive coupling circuit means connected between said collector of said input transistor and said base of said output transistor for
switching overload currents in said switchable resistive coupling circuit means to cause a voltage to develop across said switchable resistive coupling circuit means under overload conditions at said output terminal, said

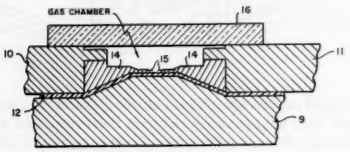
voltage being sufficiently large in magnitude to saturate said input transistor.

3,864,643

TRAVELING WAVE VACUUM SPARK AND A TRAVELLING WAVE FLASHLAMP

Ronald W. Waynant, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 23, 1973, Ser. No. 418,345
Int. Cl. H01s *3/09, 3/02, 3/22*
U.S. Cl. 331—94.5 PE **6 Claims**



1. An improved traveling wave fast rise time excitation system for production of laser emission comprising first and second flat plate transmission lines separated by an insulating sheet of polyethylene, said first transmission line separated across the middle to form spaced plate sections, an elongated electrode secured to each spaced plate section in the space formed between said plate sections facing each other in parallel alignment with a spacing between said electrodes, a chamber formed by an upper window enclosing said spacing between said spaced plate sections, means for adding a gas within said chamber, a plurality of equally spaced shorting switches secured to one edge of said flat plate transmission lines, and a switch means and conductors secured to said shorting electrodes to sequentially fire each of said switches, in order, to produce an electromagnetic wave at an angle with respect to said electrodes on said spaced plate, the improvement comprising;

a plurality of equally spaced small pin-like electrodes secured to each of said elongated electrodes in spaced relationship along the entire length thereof and insulated from said plate transmission line; and

means for exciting a gas within said chamber and simultaneously vaporizing and ionizing said pin-like electrodes progressively along the length of said plate electrode from one end to the other end to produce a plasma within said chamber.

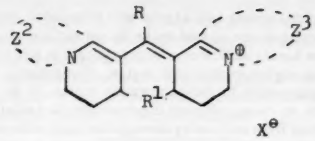
3,864,644

DYE LASERS INCLUDING RIGIDIZED CARBOCYANINE DYES

Lewis Lauren Lincoln, and Donald Warren Heseltine, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 126,988, March 22, 1971, abandoned. This application Oct. 10, 1972, Ser. No. 296,476
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 L **6 Claims**

1. A method of producing coherent laser emission in the operation of a dye laser in the wavelength range of from about 500 to about 800 nm comprising the steps of optically pumping a dye solution to produce a population inversion in said solution and stimulating the emission of a beam of radiation therefrom, said solution containing about 10^{-2} to about 10^{-4} molar concentration of a lasing dye in a non-interfering solvent, said dye having a formula as follows:



wherein:

a. each of Z and Z^1 represents the non-metallic atoms necessary to complete a heterocyclic nucleus of the type used in cyanine dyes selected from the group consisting of an imidazole nucleus, a thiazole nucleus, a benzothiazole nucleus, a naphthothiazole nucleus, a thionaphtheno-7',6',4,5-thiazole nucleus, an oxazole nucleus, a benzoxazole nucleus, a naphthoxazole nucleus, a selenazole nucleus, a benzoselenazole nucleus, a naphthoselenazole nucleus, and a 2-quinoline nucleus,

b. R represents a member selected from the group consisting of a hydrogen atom, an alkyl radical and an aryl radical,

c. R^1 represents a member selected from the group consisting of an oxygen atom, a sulfur atom, a selenium atom and a N-R^2 group wherein R^2 represents a member selected from the group consisting of a hydrogen atom, an alkyl radical having from 1 to 6 carbon atoms, an aryl radical having from 6 to 10 atoms in a mono- or polycyclic nucleus and an amino radical, and,

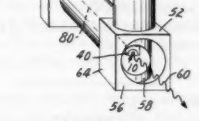
d. X^- represents an anion.

3,864,645

ELECTRON BEAM LASER OPTICAL SCANNING DEVICE

James R. Packard; Donald A. Campbell, both of St. Paul; William C. Tait, Village of Oak Park Heights, and Gunther H. Dierssen, White Bear Lake, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 42,437, June 1, 1970, Pat. No. 3,757,250, which is a continuation-in-part of Ser. No. 32,330, April 27, 1970, abandoned, which is a continuation-in-part of Ser. No. 599,576, Dec. 6, 1966, abandoned. This application Jan. 2, 1973, Ser. No. 320,254. The portion of the term of this patent subsequent to Sept. 4, 1990, has been disclaimed.
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 H **2 Claims**



1. An optical scanning device for transmitting graphic information in the form of modulated electromagnetic radiation, comprising

means for producing electromagnetic radiation by stimulated emission from a light resonant cavity including a semiconductor crystal, comprising

a light resonant cavity including a II–VI compound direct band-gap semiconductor crystal having a pair of major broad optically smooth opposing parallel surfaces;

means for providing almost totally reflective surfaces parallel to each major broad crystal surface for defining said cavity, with one reflective surface being more reflective than the other; and

means for exciting said crystal into stimulated emission by directing at one of said major broad surfaces an electron beam having sufficient energy to create in said crystal, an active region excited into a state of stimulated emission corresponding to the penetration region of the electron beam, to cause coherent electromagnetic radiation to be emitted from said cavity through the least reflective of the reflective surfaces in a direction which is substantially normal to the major broad crystal surfaces;

wherein when said coherent electromagnetic radiation is emitted, the active region depth is less than the crystal thickness in the direction normal to the parallel surfaces;

means for scanning the electron beam across said one broad crystal surface; and

means for modulating the electron beam.

3,864,646

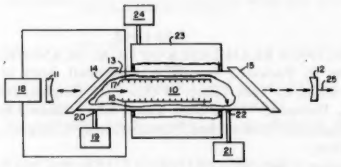
CO CHEMICAL LASER FROM KETENE GAS

David C. Phillips, and Nathan T. Melamed, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 22, 1973, Ser. No. 372,723

Int. Cl. H01s *3/22*

U.S. Cl. 331—94.5 G **10 Claims**



1. A CO chemical laser, capable of producing stimulated laser emission, comprising:

a. an enclosure;

b. a gas comprising the ketene CH_2CO;

c. means for introducing said gas into the enclosure;

d. means for supplying excitation energy to the gas comprising the ketene CH_2CO, to form an active laser medium comprising vibrationally excited CO gas by decomposition of the ketene CH_2CO;

e. means for stimulating the emission of radiation from said active laser medium.

3,864,647

SUBSTANTIALLY LINEAR MAGNETIC DISPERSIVE DELAY LINE AND METHOD OF OPERATING IT

Wayne L. Bongianni, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 26, 1973, Ser. No. 428,505

Int. Cl. H03h *9/30, 9/32;* **G11c** *11/16*

U.S. Cl. 333—30 M **5 Claims**

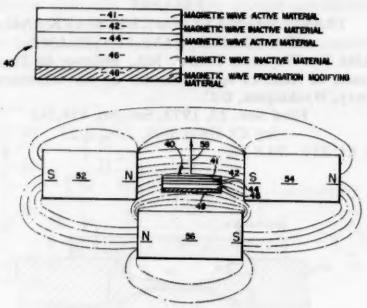
1. In combination, a magnetic delay line comprising:

a layer of electrically conductive material;

at least one layer of magnetic-wave-inactive material;

a plurality of layers of magnetic-wave-active material comprised of yttrium iron garnet disposed in stacked relation, and;

at least one of said layers of magnetic-wave-active material being spaced apart from another layer of magnetic-wave-active material and from the layer of electrically conductive material by one of said at least one layer of magnetic-wave-inactive material.



3,864,648

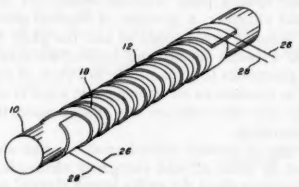
MICROWAVE PHASE SHIFTER AND METHOD FOR ITS MANUFACTURE

Jack C. McVickers, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 20, 1974, Ser. No. 452,865

Int. Cl. H03h *7/30, 13/00*

U.S. Cl. 333—31 R **7 Claims**



1. In a ferrite phase shifter, the combination of an elongated bar of ferrite material, and a spirally-wound laminate surrounding said body with successive convolutions of the laminate overlapping preceding convolutions, the laminate comprising a ribbon of insulating material having an inner coating of electrically conductive material thereon whereby a capacitive effect will be produced between successive overlapping portions of the convolutions.

3,864,649

ELECTRICAL SAFETY DEVICE WITH IMPROVED TRIP MECHANISM

Richard C. Doyle, Benicia, Calif., assignor to The Rucker Company, Concord, Calif.

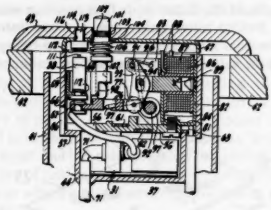
Division of Ser. No. 271,988, July 14, 1972, , which is a continuation-in-part of Ser. No. 141,151, May 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 87,713, Nov. 9, 1970, abandoned. This application Mar. 20, 1974, Ser. No. 452,956

Int. Cl. H01h *73/02*

U.S. Cl. 335—21 **5 Claims**

1. In an electrical safety device for controlling the flow of current in a conductor and interrupting the flow in the event of a predetermined current: first and second contacts for making and breaking a circuit with the conductor, a floating

contact arm having the first contact mounted thereon and movable relative to the second contact, a latch member releasably engaging the contact arm at a point spaced from the first contact, resilient means engaging the contact arm between the first contact and the latch member for urging contacts together when the latch member is engaging the contact arm, said resilient means serving to pivot the arm



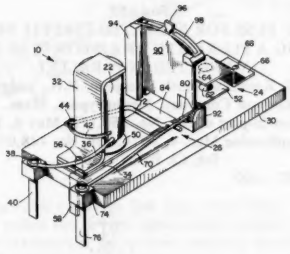
about the contacts to provide rocking movement between the contacts when the latch member is disengaged from the arm, means for disengaging the latch member from the contact arm in response to the predetermined current, and a fulcrum member positioned for engaging the contact arm between the first contact and the resilient means when the arm has pivoted a predetermined distance about the contacts and thereafter cooperating with the resilient means to separate the contacts.

3,864,650

MANUALLY SET MAGNETIC RELAY

Thomas E. Evans, Rehoboth, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 5, 1973, Ser. No. 421,902
Int. Cl. H01h *45/00*
U.S. Cl. 335—186 **9 Claims**



1. A manually set magnetic relay for one-time operations comprising:

first switch means operatively connectible in a load circuit;

electromotive force generating means including an electromagnetic coil operatively connected to the first switch means for completing the load circuit upon energization of the coil;

second switch means serially coupled to the coil to permit energization and de-energization of the coil, the second switch means including first and second movable conductors positioned with portions of the conductors in overlying relationship for movement in and out of electrical contact to close or open the circuit through the second switching means and the coil;

latch means operatively engageable with the first conductor of the second switch means for holding the first conductor in a latched position out of contact with the second conductor of the second switch means;

the electromotive force generating means also being operatively coupled to the second conductor of the second switch means for moving the first conductor into the latched position; and

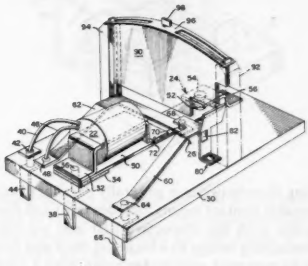
manually operable actuator means engagable with the first conductor of the second switch means for moving the first conductor out of the latched position.

3,864,651

MANUALLY SET MAGNETIC RELAY

Charles D. Flanagan, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 5, 1973, Ser. No. 421,903
Int. Cl. H01h *45/00*
U.S. Cl. 335—186 **6 Claims**



1. A manually set magnetic relay for one-time operations comprising:

first switch means operatively connectible in a load circuit and including a cantilevered, flexible clapper arm;

electromotive force generating means including a coil operatively connected with the clapper arm of the first switch means for closing the first switch means upon energization of the coil;

second switch means serially coupled with the coil to permit energization of the coil, the second switching means including first and second conductors having portions positioned in overlying relationship for flexing in and out of contact to thereby close and open the second switch means, the second conductor extending in transverse relationship to the clapper arm of the first switch means and being engaged by the clapper arm for flexing in and out of contact with the first conductor of the second switch means;

latch means operatively engageable with the first conductor of the second switch means for holding the first conductor in a latched position out of contact with the second conductor of the second switch means;

the electromotive force generating means being operatively coupled to the first conductor of the second switch means for moving the first conductor into the latched position; and

manually operable actuator means engageable with the latching means for releasing the first conductor of the second switch means from the latched position.

3,864,652

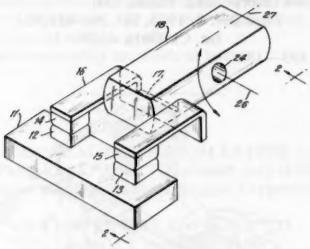
FLOATING CONTACT MEANS

Martin V. Zubaty, Bellefontaine, Ohio; Frank W. Kussy, Haverford, and Gustave E. Heberlein, Jr., Chalfont, both of Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Mar. 4, 1974, Ser. No. 447,654
Int. Cl. H01h *3/06*
U.S. Cl. 335—194 **10 Claims**

1. A switch device including stationary contact means positioned generally in a first plane, movable contact means oper-

able into and out of engagement with said stationary contact means, an elongated arm having said movable contact means mounted thereto at its forward end, means defining a main axis positioned to the rear of said movable contact means, said movable contact means being mounted for pivotal movement about said main axis as a center to disengage said stationary contact means, with said pivotal movement being generally in a second plane at right angles to said first plane, said stationary contact means including spaced first and second contacts insulated from one another when said switch device is open, said first and second contacts being positioned so that a line



extending therebetween is generally parallel to said main axis, said movable contact means includes third and fourth contacts engageable with the respective first and second contacts, a rigid conducting bridge to which said third and fourth contacts are fixedly mounted, said bridge comprising a conducting path between said first and second contacts when said switch device is closed, and means defining a single auxiliary axis about which said movable contact means is pivotable to seat said movable contact means in engagement with said stationary contact means, said auxiliary axis extending generally parallel to the longitudinal axis of said arm and at right angles to said first axis generally parallel to said second plane.

3,864,653

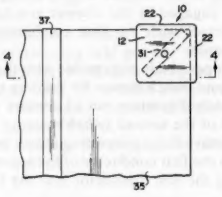
MAGNETIC CORNER GUARD

Richard L. Walker, 2596 Wadsworth Rd., Norton, Ohio 44203

Filed Apr. 1, 1974, Ser. No. 457,089

Int. Cl. H01f *7/20*

U.S. Cl. 335—285 **8 Claims**



4. A magnetic corner guard according to claim 1, wherein said magnet is attached to said end portion.

3,864,654

ELECTRICAL SWITCHES

David Charles Bradbury, Weoley Castle, and George Henry Brown, Birmingham, both of England, assignors to The Lucas Electrical Company Limited, Birmingham, England

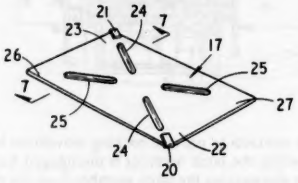
Filed July 25, 1973, Ser. No. 382,382

Claims priority, application Great Britain, July 25, 1972, 34684/72

Int. Cl. H01h *61/00*

U.S. Cl. 337—135 **3 Claims**

1. An electrical switch of the intermittently operating type comprising a body, a fixed contact on said body, a resilient, rectangular vane mounted on said body to be flexed between a first position and a second position, said vane being embossed so that flexing occurs with a snap-action and so that said vane is inherently biased into its second position, a contact movable with said vane and arranged to engage said fixed contact when said vane is in one of its positions and to be displaced from said fixed contact when said vane is in the other of its positions, and a heat extensible, electrically conducting strip connected to diagonally opposite corners of said vane so as to hold the latter in its first position when said strip is unheated but to allow said vane to snap into its second position when said strip is heated, said strip being electrically connected with said movable contact and a terminal on said



body, wherein said vane is formed with two sets of embossments thereon, one set of embossments being formed by recesses formed in one surface on said vance so as to define projections on the other surface of said vane, and the other set of embossments being formed by recesses in said other surface of said vane so as to define projections on said one surface of said vane, said recesses of said other set of embossments comprising a pair of longitudinally spaced elongate recesses on the diagonal joining said diagonally opposite corners of said vane, and said recesses of said one set of embossments comprising a pair of longitudinally spaced elongate recesses extending along the diagonal joining the other diagonally opposite corners of said vane.

3,864,655

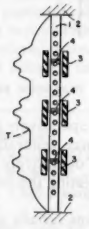
ELECTRIC FUSE FOR ELEVATED CIRCUIT VOLTAGES HAVING A PLURALITY OF RIBBON FUSE LINKS CONNECTED IN PARALLEL

Frederick J. Kozacka, South Hampton, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Continuation-in-part of Ser. No. 250,175, May 4, 1972. This application Mar. 4, 1974, Ser. No. 448,074

Int. Cl. H01h *85/04*

U.S. Cl. 337—160 **6 Claims**



1. An electric fuse for elevated ciruit voltages including
a. a tubular casing of electric insulating material;
b. a pair of electroconductive terminal elements closing the ends of said casing,
c. a pulverulent arc-quenching filler of quartz particles inside said casing;
d. a plurality of fusible elements forming parallel current paths conductively interconnecting said pair of terminal elements, each of said plurality of fusible elements having

serially arranged alternating points of relatively small cross-sectional area and of relatively large cross-sectional area;

e. a plurality of metal-severing low fusing point overlays on said plurality of fusible elements, at least one of said plurality of metal-severing low fusing overlays being supported by each of said plurality of fusible elements, and

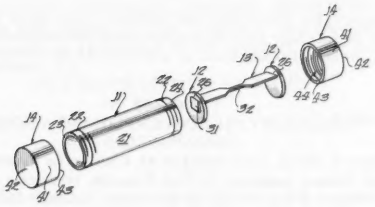
f. a plurality of pellets of a gas-evolving material having a smaller thermal conductivity than said arc-quenching filler mounted on and supported by each of said plurality of fusible elements, said plurality of pellets having holes therein allowing each of said plurality of fusible elements to be threaded through one of said holes, and each of said plurality of fusible elements supporting at least one of said plurality of pellets arranged to cover one of said plurality of metal-severing low fusing point overlays, and each of said plurality of fusible elements further supporting at least one of said plurality of pellets arranged to cover one of said points of relatively small cross-sectional area from which a metal-severing low fusing point overlay is absent.

3,864,656

CARTRIDGE FUSE

Bernard C. Labelle, 324 Valley Brook Dr., Lancaster, Pa. 17601

Filed Feb. 19, 1974, Ser. No. 443,901
Int. Cl. H01h *85/30*
U.S. Cl. 337—206 **3 Claims**



1. A renewable cartridge link fuse comprising:

an open ended sleeve type substantially tubular body member of transparent polysulfone material providing unobscured visibility therethrough;

a pair of substantially flat disc shaped terminal plate members each having a slotted opening provided therein, each plate member having a diameter greater than the interior diameter of said body member and less than the exterior diameter of said body member, each plate member adapted to restingly engage an associated end of said body member concentric with the axis of said body member;

a solid fusible electrical conductive link element adapted to melt at a given temperature, each end of said link adapted to pass through an associated slotted opening of an associated plate member and then be bent at an angle of about ninety degrees to overlie the exterior surface of said plate member; and

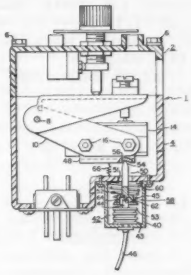
a pair of external electrical circuit connection means, each of said means adapted to be mounted to an associated end of said body member and electrically connect to said fusible link providing a series electrical circuit through said fusible link element.

3,864,657

CONDITION RESPONSIVE CONTROL DEVICE

Ronald W. Brown, Minneapolis, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Jan. 14, 1974, Ser. No. 433,335
Int. Cl. H01n *37/36*
U.S. Cl. 337—311 **4 Claims**



1. A control device including:

a frame;

an expandable bellows member attached at one end to said frame and having a condition responsive movable end;

a lever arm movably supported on said frame to actuate electric switch means;

a linkage member to be interposed between said bellows movable end and said lever arm and having a first knife edge engaging said lever arm and a second knife edge engaging said bellows movable end whereby relative displacement of said bellows movable end are transmitted through said linkage to thereby cause said lever arm to be moved;

a cup-shaped spring engaging means extending from said linkage member to surround its second end; and

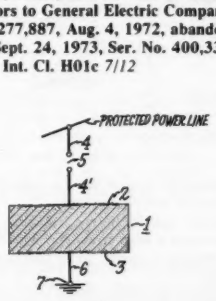
conical spring means having a base end and an apex end, said base end engaging said frame portion and said apex end being received by said cup-shaped means, to thereby bias said linkage member against said bellows member movable end and provide a desired alignment of said linkage.

3,864,658

ELECTRODE FOR A GRANULAR ELECTRICAL CIRCUIT ELEMENT AND METHOD OF MAKING SAME

John J. Pitha, Lenox, Mass., and Howard F. Ellis, Stephentown, N.Y., assignors to General Electric Company

Division of Ser. No. 277,887, Aug. 4, 1972, abandoned. This application Sept. 24, 1973, Ser. No. 400,337
Int. Cl. H01c *7/12*
U.S. Cl. 338—21 **4 Claims**



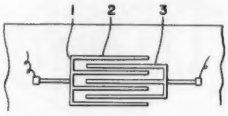
1. A non-linear resistor having a body constituted of a mass of carbide grains of the class consisting of silicon carbide, tungsten carbide and boron carbide, in combination with at least one low resistance electrode affixed to a predetermined surface area of said body in electrical conducting relationship

therewith, said electrode comprising a composition consisting of at least 30 percent by weight of Ti and 20 percent by weight of Cr contained in a matrix.

3,864,659
HUMIDITY SENSOR

Shigemasa Furuuchi; Hironiri Ohta; Koichi Sugaya, and Tadatoshi Kamimori, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed July 25, 1973, Ser. No. 382,517
Claims priority, application Japan, July 25, 1972, 47-73809; Mar. 27, 1973, 48-34096
Int. Cl. H01c *13/00*
U.S. Cl. 338—35 **4 Claims**

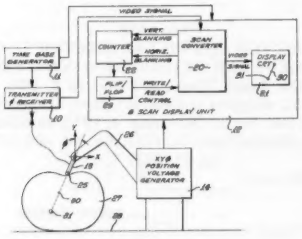


1. In a humidity sensor which comprises a pair of electrodes which are arranged parallel to one another with a suitable gap therebetween and which are fitted on the surface of a glass plate to automatically detect the formation of condensed moisture within the gap between the electrodes, the improvement which comprises the application of a membrane over the electrodes of said humidity sensor and the gap between the electrodes wherein said membrane is prepared by curing an amino group containing organosilicon compound, wherein said amino group containing organosilicon compound is an amino-organofunctional alkoxysilane.

3,864,660
ULTRASCOPE

Ralph Ranalli, Anaheim, and Kenneth R. Torrence, Santa Ana, both of Calif., assignors to Rohe' Scientific Corporation, Santa Ana, Calif.

Filed Sept. 10, 1973, Ser. No. 395,427
Int. Cl. G01s *7/56, 7/62*
U.S. Cl. 340—1 R **4 Claims**



1. An ultrasonic system having transmitter, ultrasonic transducer, receiver and display unit,

said display unit including a display screen with a sweep pattern and a scan converter with mode selection means for selecting separate write and read modes for the converter;

timing means for determining write mode periods and read mode periods each of a duration a portion of the sweep pattern duration;

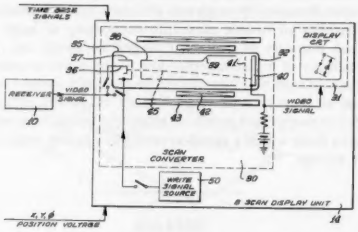
means for synchronizing said timing means with said sweep pattern; and

means for controlling said mode selection means as a function of said timing means providing write and read modes at separate times in said scan converter corresponding to said write and read periods.

3,864,661
ULTRASCOPE

Ralph Ranalli, Anaheim, Calif., assignor to Rohe' Scientific Corporation, Santa Ana, Calif.

Filed Sept. 10, 1973, Ser. No. 395,426
Int. Cl. G01s *7/56, 7/62*
U.S. Cl. 340—1 R **5 Claims**



1. In an ultrasonic system having transmitter, ultrasonic transducer, receiver and display unit,

said receiver providing a video signal to said display unit,

said display unit including a scan converter with storage tube and having write, read and erase modes,

the system including in combination

a write signal source,

means for said connecting said write signal source to said storage tube when in the write mode for writing a solid picture, and

means for connecting said receiver video signal to said storage tube when in the erase mode for selective erasing from said solid picture as a function of said video signal.

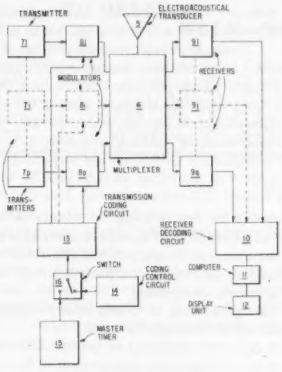
3,864,662
TELEMETRY SYSTEMS EMPLOYING ACTIVE TRANSPONDERS

Pierre Y. David, Lyon, and Joel M. Charles, La Velette, both of France, assignors to Etat Francais, represente par le Ministre d'Etat charge de la Defense Nationale-Delegation Ministerielle pour l'Armement-Direction Technique des Constructions, Paris, France

Filed May 18, 1973, Ser. No. 361,427
Int. Cl. G01s *9/68, 5/18*
U.S. Cl. 340—3 R **4 Claims**

1. A telemetry method for positioning at least a first body, carrying an interrogator, relative to at least two stationary active transponders whose relative coordinates are initially unknown, wherein positioning is performed by transmitting an interrogation code to which the transponders respond according to their individual codes, the interrogation code comprising a plurality of distinct frequencies equal in number to $n + 2$ where the number of reference transponders is 2^n, said method being characterized by redundantly determining, prior to any operation in the positioning of the body, the coordinates of the transponders using a first interrogation code which, in addition to the n frequencies used in identifying the reference transponders, comprises an additional frequency termed the general frequency such that when a said interrogation code made up of the general frequency and the identification code of a particular reference transponder is transmitted, only that particular transponder responds to this said general frequency while the other transponders respond responsive to their receiving the response to the general frequency of the transponder initially interrogated, and determining, using said interrogator, the periods, corresponding to the distances between each transponder and the body and to

the sum of the distances between the interrogated transponder and the other transponders; the determination being repeated for each reference transponder to provide a redundant measurement of the distance between each of the reference transponders and the system of relative coordinates being completely determined when the reference transponders have transmitted a characteristic code representative of the distance in a horizontal reference plane in response to further, predetermined interrogation code.

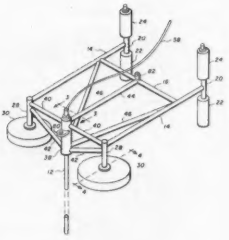


3,864,663

FLOATING ELECTRODE HOLDING APPARATUS

David R. Bon, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washinton, D.C.

Filed Dec. 12, 1973, Ser. No. 424,236
Int. Cl. B63b *21/52*
U.S. Cl. 340—4 R 7 Claims



1. Electrode holding apparatus for supporting a rod-like electrode in a predetermined position in a body of water, said apparatus comprising:

a generally rectangular frame adapted to lie in a plane that is substantially parallel to the surface of said body of water when said apparatus is in a position of use, said frame comprising a pair of spaced, parallel, side members and a plurality of transverse members, said side and transverse members being formed of tubular metal;

a plurality of first legs extending from one end of said frame, orthogonal to said plane, and to one side thereof;

a plurality of second legs extending from the other end of said frame, orthogonal to said plane, and to both sides thereof;

flotation means, connected to said frame for supporting said frame in said plane, said flotation means comprising a plurality of first floats each fixed to a corresponding one of said plurality of first legs, a plurality of second floats each fixed to a corresponding one of said plurality of second legs, and said second floats being disposed on the end portions of said second legs extending to one side of said plane;

a sleeve member, comprising a tubular metal member carried by said frame substantially at one end thereof, said sleeve member being supported between first ends of said side members and defining an electrode receiving passage extending substantially normal to said plane;

electrode means, extending vertically through said sleeve member and into said body of water, for providing electrical contact with said body of water; and

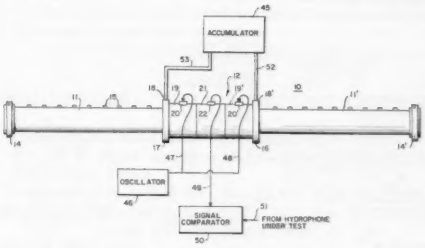
said apparatus further comprising a liner of electrically insulating material disposed in said passage of said sleeve member so as to electrically insulate said electrode from said frame.

3,864,664

LINE HYDROPHONE ARRAY ELEMENT CALIBRATOR

W. James Trott, Annandale, and Joseph F. Zalesak, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 25, 1973, Ser. No. 373,323
Int. Cl. H04b *11/00*
U.S. Cl. 340—5 C 14 Claims



1. A hydrophone testing system comprising:

a tubular unit open at both ends containing means for producing and receiving sound pressure and for receiving a hydrophone to be tested, said means having a sound receiving tube and sound producing tubes located coaxial with and adjacent to each end of said sound receiving tube, said tubular unit being adapted to be submerged in water.

3,864,665

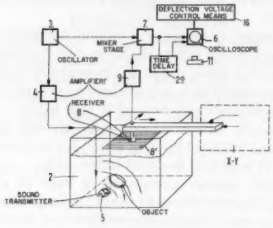
PROCESS FOR RECORDING ACOUSTIC, SYNTHETIC AND MICROWAVE HOLOGRAMS

Dietlind Pekau, Krailling, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Feb. 14, 1973, Ser. No. 332,374
Claims priority, application Germany, Feb. 21, 1972, 2208061
Int. Cl. G03b *41/00*
U.S. Cl. 340—5 H 6 Claims

1. In a process of recording acoustic, synthetic and microwave holograms in which process an object wave field emanating from an object is scanned point by point and row by row by a receiving transducer which produces an electrical output signal which are transformed into light signals that are recorded as holograms on a light sensitive medium point by point in rows, the improvement comprising recording each row a second time on the light sensitive medium to provide a first and second recorded row for each row scanned by the

receiving transducer, the recording of each second recorded row on the light sensitive medium being controlled to displace



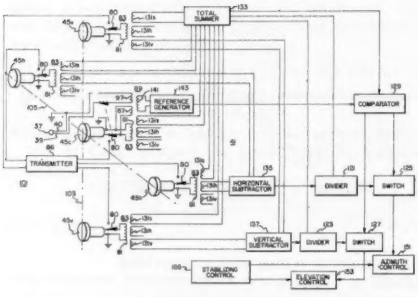
the position of the second recorded row both perpendicular and parallel to the position of its respective first recorded row.

3,864,666

DIRECTIONAL SONAR APPARATUS

George R. Douglas, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed June 12, 1973, Ser. No. 369,329
Int. Cl. G01s *3/80*
U.S. Cl. 340—6 R **12 Claims**



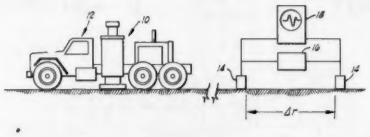
1. Directional sonar apparatus for receiving signals from sources in predetermined directions with respect to said apparatus, said apparatus including an array of main electroacoustic transducers, said electroacoustic transducers being spacially distributed with respect to each other so that the response of said array to said signals is directional, the directional pattern of said response having a main lobe and at least one side lobe, the response to said signals along the direction of said main lobe being substantially greater than the response to said signals along the direction of said side lobe, at least one predominately omnidirectional auxiliary electroacoustic transducer in receiving relationship with said signals, said auxiliary transducer being connected to at least one of said main electroacoustic transducers to produce a combined response with said one transducer, actuable means connected to said array and said auxiliary transducer to be actuated thereby, and means connecting said auxiliary electroacoustic transducer and said one main electroacoustic transducer in comparison relationship with said array of main transducers so that said combined response of said auxiliary transducer and said one main transducer modifies the response of said array so as to suppress the actuation of said actuable means responsive to signals along the direction of said side lobes but to permit actuation of said actuable means along the direction of said main lobe.

3,864,667

APPARATUS FOR SURFACE WAVE PARAMETER DETERMINATION

Dhari S. Bahjat, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Sept. 11, 1970, Ser. No. 71,488
Int. Cl. G01v *1/28*
U.S. Cl. 340—15.5 SW **3 Claims**



1. Apparatus for determining the observed frequency and the observed phase shift of a surface wave at a particular test location, the observed frequency and the observed phase shift being utilized to determine the parameters of a near surface layer of the earth, comprising:

means for generating a continuously varving frequency seismic signal through the earth;

a pair of detectors disposed at the test location adapted to detect the surface wave component of the seismic signal, the detectors being spaced a predetermined distance apart;

means for measuring the observed frequency of the surface wave detected by the two detectors; and

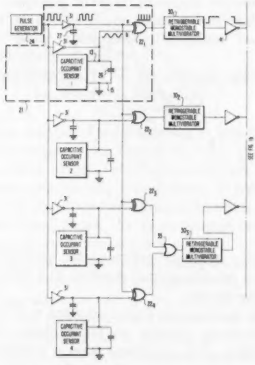
means for measuring the observed phase shift of the surface wave detected by the two detectors.

3,864,668

SEAT BELT WARNING AND IGNITION INTERLOCK SYSTEM

David Edward Bickford, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 31, 1973, Ser. No. 328,224
Int. Cl. B60r *21/10*
U.S. Cl. 340—52 E **4 Claims**



1. In a seat belt warning system for vehicles an occupant detector means for detecting the presence of an individual seated on the vehicle seat comprising:

a variable capacitive means responsive to the presence of a seated occupant to assume a first value of capacitance and responsive to the absence of a seated occupant to assume a second value of capacitance;

means for producing a series of electrical pulses having a first predetermined rise time;

signal coincidence means having first and second inputs;

first circuit means for supplying said series of electrical pulses directly to a first input of said coincidence means; and

second circuit means including said variable capacitive means for supplying said series of electrical pulses to the second input of said coincidence means;

said second circuit means constructed to supply output pulses to said coincidence means having the same rise time as the pulses supplied through said first circuit means to the first input of said coincidence means when said variable capacitance means assumes its second value; said second circuit means further constructed to alter the rise time of said pulses supplied to said coincidence means when said variable capacitive means assumes its first value;

said altered rise time of said pulses being different from said predetermined rise time;

said coincidence means responsive to the pulses supplied to its first and second input leads to provide an output of a first magnitude when said rise times are identical and to produce an output of a second magnitude when said rise times are different.

3,864,669
CORRECTION ARRANGEMENT FOR ELECTRONIC TYPEWRITERS

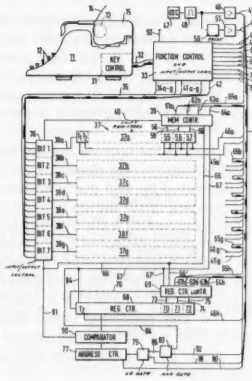
Klaus Schlickeiser, Boll/Hech, and Hartmut Linke, Hechingen, both of Germany, assignors to Walter Buhmann Elektro-Apparatebau GmbH, Stetten bei Hechingen, Germany

Filed Sept. 11, 1972, Ser. No. 288,000

Claims priority, application Germany, Sept. 10, 1971, 2145287

Int. Cl. G11c *19/00*; **B41j** *5/00*

U.S. Cl. 340—172.5 **15 Claims**



1. In a system for furnishing a visual output corresponding to selected ones of a plurality of alphanumeric inputs each represented by a code word having a predetermined number of places, and having function control means for furnishing a selected one of a plurality of function signals including a "write" signal and a "delete" signal upon external activation, a correction arrangement for deleting from said visual output a determined one of said alpha-numeric inputs, comprising, in combination, memory means for storing said code words, said memory means comprising a plurality of synchronously operable circulating storage means, one for each of said places, each having a determined pluralitv of storage locations arranged in a predetermined order, said plurality of storage locations including a first storage location, a last storage location, a next to the last storage location immediately preceding said last storage location in said predetermined order, and a third last storage location immediately preceding said next to the last storage location in said predetermined order; synchronizing means connected to said memory means, for furnishing synchronizing signals to said plurality of synchronously operable circulating storage means in such a manner that said storage means transfers information from each of said storage locations to the next subsequent one of said storage locations in said predetermined order in response to each of said synchronizing signals; first counting means connected to said synchronizing means for counting said synchronizing signals and furnishing a first counting signal signifying the number of so-counted synchronizing signals; externally operable address signal furnishing means for furnishing address signals each signifying one of said storage locations in said predetermined order; comparator means connected to said address signal and furnishing a comparator output signal when said first counting signal corresponds to said address signal; memory control means connected to said comparator means, said function control means and said memory means for selectively connecting the outputs of said last or next to the last storage locations to said first storage locations under control of said function signals and said comparator output signal in such a manner that said last storage location is disconnected from said first storage location when the code word representing said determined one of said alpha-numeric inputs is in said last storage location, whereby said code word is deleted from the sequence of code words stored in said memory means; and output means connected to said memory means for furnishing said visual output in correspondence to said sequence of code words stored in said memory means.

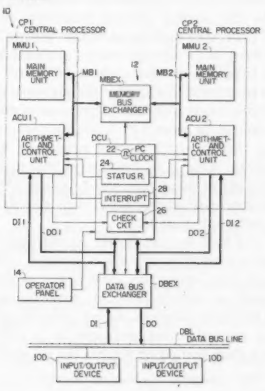
3,864,670
DUAL COMPUTER SYSTEM WITH SIGNAL EXCHANGE SYSTEM

Tadanari Inoue, and Osamu Tada, Kazutaka, Watanabe, Tokyo, all of Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 182,489, Sept. 21, 1971, abandoned. This application Feb. 22, 1973, Ser. No. 334,857

Int. Cl. G06f *15/16*, *15/20*

U.S. Cl. 340—172.5 **8 Claims**



1. A dual computer system for highly reliable use in industrial process instrumentation for complex processes having a number of variable process conditions such as temperature, flow rate, and the like, and arranged to receive signals representing the values of various process conditions, the store data comprising programs and base data for performing computations respecting process conditions, and to produce corresponding output signals for use in controlling the process, said dual computer system comprising:

a pair of synchronized central processors, one of which acts as a principal central processor and the other of which acts as an auxiliary central processor, each central processor comprising an arithmetic and control unit, having registers for data storage, a main memory unit for data storage, a memory bus which connects the arithemtic and control unit with the main memory unit, means for exchanging memory data signals on the memory bus between the main memory unit and the registers of the arithmetic and control unit, and input/output terminals for receiving input data signals into and transferring output data signals from the arithmetic and control unit;

input/output devices for exchanging process input/output data signals with the dual computer system;

a data bus line connecting to the input/output devices;

data bus exchange means for controlling the connections between the input/output terminals of the principal and auxiliary central processors and the data bus line;

a memory bus exchange means for controlling the connections between the memory bus of the principal central processor and the memory bus of the auxiliary central processor and thereby allowing the two central processors to exchange memory data signals; and

a dual control unit supplied with the output data signals from the arithmetic and control units of the two central processors and arranged to control the data bus exchange means and memory bus exchange means, said dual control unit comprising a clock circuit for synchronizing the pair of central processors, means responsive to the output data signals from the two arithmetic and control units of the two central processors for detecting a lack of coincidence therebetween corresponding to the failure of one of the central processors, means responsive to detection of lack of coincidence between said output data signals for causing the data bus exchange means to disconnect the data bus line from both central processors, means including diagnostic programs stored in both central processors and operating upon detection of lack of coincidence between said output data signals for determining the failed central processor, means responsive to said failure determination means for causing the data bus exchange means to connect the data bus line with the input/output terminals of the normal central processor for resumption of computations respecting process conditions by the normal central processor while the failed central processor undergoes repair, means for controlling the memory bus exchange means to transfer memory data signals from the normal central processor to a repaired central processor to equalize the memory of the repaired central processor with the instantaneous memory content of the operating normal central processor, and means for starting the repaired central processor with equalized memory to cause it to operate in synchronism with the normal central processor and to cause the data bus exchange means to supply input data signals to both arithmetic and control units,

whereby if a fault occurs in one of the central processors, the faulty central processor is located, repaired and restored to dual operation, and either of the two central processors is responsible for input/output operations, except for short intervals during error diagnosis, whereby the two central processors provide a very reliable and effective dual computer system for process control.

3,864,671

PACKAGE STRUCTURE FOR MOVABLE MAGNETIC DOMAIN DEVICES

Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 10, 1972, Ser. No. 242,475

Int. Cl. G11c *11/14*

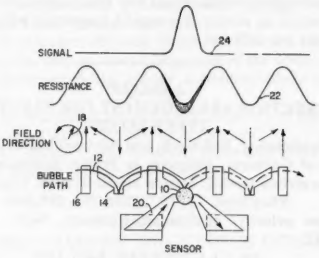
U.S. Cl. 340—174 MA **5 Claims**

1. In combination:

a. a digital signal translating device of the type employing mobile magnetic domains in uniaxially anisotropic magnetic media capable of sustaining said domains in the presence of a predetermined magnetic biasing field and operative in response to electrical signals applied to said device over electrical conductors while such magnetic bias field is simultaneously applied thereto to move said magnetic domains between predetermined locations in said magnetic media;

b. a package protectively enclosing said device, said package having means forming a rigid structural frame member of said package and consisting of a material which is both a high coercivity permanent magnet and an electrical insulator for simultaneously providing said package structural member, a magnetic biasing field, and an electrically insulating terminal strip for said conductors providing said electrical signals to said device in said package;

c. means to support said device within said frame member in fixed relationship thereto;



d. said support means including an optically non-distorting transparent portion positioned to permit visual inspection of said signal translating device during manufacturing assembly of said package device to determine by a visual image of said magnetic material that the intended mobile domains have, in fact, been created at the desired locations;

e. electrical conductors for terminating the circuits of said signal translating device, said electrical conductors being insulatively supported by said frame member; and,

f. electrically insulating cover means to close said package, said cover means including a transparent portion aligned with said transparent portion of said support means to permit said visual inspection of said signal translating device, said structrual frame member entirely surrounding said signal translating device in at least one plane of said device and said insulating cover means and said support means forming with said structural frame member a totally closed package in which said signal translating device is housed.

3,864,672

MATRIX STORE WIRING PATTERN

Pierre Ingelaere, Evreux, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 6, 1973, Ser. No. 377,070

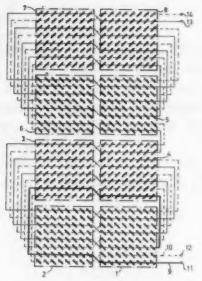
Claims priority, application France, July 12, 1974, 74.25285

Int. Cl. G11c *11/02, 5/02*

U.S. Cl. 340—174 M **5 Claims**

1. A matrix store, comprising toroidal magnetic storage elements arranged in arrays of rows and columns each array comprising a plurality of rectangular fields each side of said array comprising an integer multiple of two fields, said storage

elements in each field being oriented diagonally with respect to said rows and columns and provided with a row selection wire per row and a column selection wire per column and two sense wires, a first plurality of said fields operatively responsive to a first plurality of adjacent row selection wires being identified as higher fields, a second plurality of said fields operatively responsive to a second plurality of adjacent row selection wires being identified as lower fields, each of said sense wires being operatively responsive to one half of the columns of each field said sense wires forming, while crossing each other, at a transition between a higher and lower field, respectively which adjoin each other in the column direction, a bipolar propagation line, all of said storage elements within



a field being orientated parallel to a single diagonal to said columns and rows, said storage elements of two fields which adjoin each other in the direction of said rows being orientated according to two different diagonals to said columns and rows, said sense wires being arranged such that they form a spiral having substantially right angle turns, the widths of said turns being substantially equal to the width of said fields in the direction of the rows and consisting of two half-turns which are staggered in each turn with respect to each other, one of said half turns extending between identically sequenced columns in adjacent higher fields, and the other of said half turns extending between columns of different sequence than said one half turn, successive turns overlapping preceding and succeeding turns.

3,864,673

ANNUNCIATOR FOR AN ELECTRICAL SYSTEM INCLUDING BUILT-IN TEST EQUIPMENT

Geary L. Thomas, Cypress; Raymond G. Kostanty, Long Beach, and David San Julian, Stanton, all of Calif., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Dec. 17, 1973, Ser. No. 425,480
Int. Cl. G08b *29/00*
U.S. Cl. 340—214 **8 Claims**

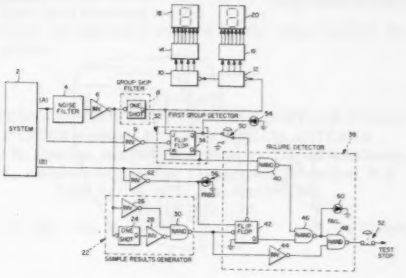
1. For use with a system of the type including built in test equipment for self-testing purposes, and which system provides first pulses indicative of the count of the steps in a test sequence and second pulses indicative of the successfully completed steps, an annunciator comprising:

counting means connected to the system and responsive to the first pulses for annunciating the count of the steps in the test sequence;

sampling means connected to the system for sampling the first pulses prior to the completion of a test step and for providing an output indicative of a failure of said step;

test step group detecting means connected to the system and responsive to the first pulses for detecting the completion of a predetermined first group of test steps in the test sequence and for providing an output indicative of the completion of said first group; and

failure detecting means connected to the system, the sampling means and the group detecting means and responsive to the second pulses, the sampling means output and



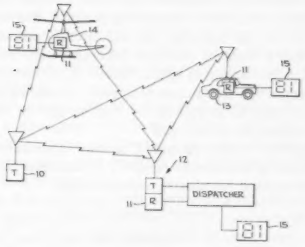
the group detecting means output for providing an output indicative of a failed test step in a group other than the first group.

3,864,674

EMERGENCY RADIO WARNING SYSTEM

Robert Worsham, Opa Locka, and Stephen J. Martin, Miami, both of Fla., assignors to Criminalistics, Inc., Opa Locka, Fla.

Filed Dec. 18, 1972, Ser. No. 315,856
Int. Cl. H04b *7/00*; **H04q** *11/02*
U.S. Cl. 340—224 **16 Claims**



1. An emergency radio warning system comprising:

a sensor operable upon an emergency condition;

means operated by the sensor in response to an emergency condition for generating and transmitting a radio signal having a predetermined frequency;

means for modulating the generating and transmitting means with an identification signal having one or more simultaneously generated frequencies selected from a group of four frequencies in accordance with an identifying binary coded decimal digit;

said modulating means including one or more oscillator circuits, each having in circuit a tuning fork filter resonant at a respective selected frequency;

means for receiving the modulated radio signal and detecting the identification signal;

said receiving and detecting means including four tuning fork filters resonant at the respective four frequencies; and

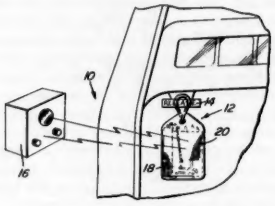
means responsive to the identification signal for displaying the decimal digit corresponding to the detected identification signal to indicate the location of the emergency condition.

3,864,675

MOTION RESPONSIVE SWITCH AND ALARM SYSTEM

Floyd A. Colibert, P.O. Box 11395, Salt Lake City, Utah 84111

Filed June 13, 1973, Ser. No. 369,490
Int. Cl. G08b 13/02; B60r 25/10
U.S. Cl. 340—224 7 Claims



1. A self-contained detector for an alarm system to provide signals to a remote receiver, said detector comprising

an enclosure;

mounting means attached to said enclosure whereby said enclosure is adapted to be freely suspended beneath said mounting means;

motion responsive switch means having

an elongate housing in said enclosure, said housing being arranged to be substantially vertical when the enclosure is suspended by the mounting means,

an upper electrical contact member extending into the housing at the top thereof when said enclosure is suspended beneath the mounting means,

a lower electrical contact member extending into the housing at the bottom thereof when the enclosure is suspended from the mounting means,

an electrical conductive movable contact member, and means resiliently mounting the movable contact member in the housing and electrically connected to the upper contact member whereby the entire movable contact is closely spaced above the lower contact member when the means resiliently mounting the movable contact is stretched by the weight of the movable contact member; and

transmitter means mounted in said enclosure to provide signals to the remote receiver in response to actuation of said motion responsive switch means.

3,864,676

MOISTURE DETECTOR

Helene Macias, and Angos Winke, both of 1535 N. Serrano Ave., Hollywood, Calif. 90027

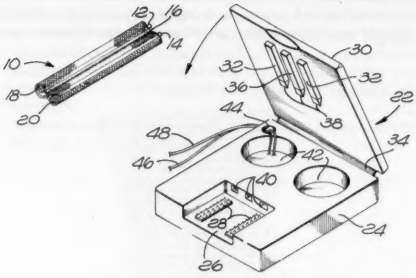
Filed Sept. 10, 1973, Ser. No. 395,722
Int. Cl. G08b 21/00; A61b 19/00
U.S. Cl. 340—235 10 Claims

1. A portable moisture detector for sensing and indicating the flow of fluid in a specified region, comprising:

a sensor portable with the body of the user comprising two closely spaced, elongated, flexible conductors, each conductor being enclosed in a soft, porous sheath separating the conductors from each other and from the user's body to normally provide electrical isolation between the conductors but allowing an electrical short between them in the presence of a bridging fluid;

signal generator and alarm means electrically connected to said sensor to provide an indication of a short between said conductors; and

an electrically insulated connector for receiving one end of said sensor and providing said electrical connection between said sensor and said signal generator and alarm means, said connector comprising a slotted connector base, a connector cover, and means for providing an enclosed electrical connection between said sensor and said signal generator and alarm means and for mechanically gripping and supporting the end of said sensor inserted into the connector slot when the connector cover is closed.

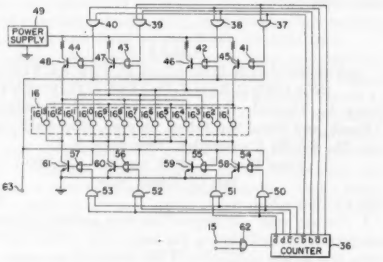


3,864,677

REGISTER OVERFLOW WARNING DEVICE

Shigeharu Bekki, Yokohama; Akihiro Yamataka, Funabashi; Takashi Mikami, and Juji Kishimoto, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 13, 1972, Ser. No. 288,739
Claims priority, application Japan, Sept. 17, 1971, 46-84504; Sept. 17, 1971, 46-84505
Int. Cl. G08b 5/00
U.S. Cl. 340—248 R 8 Claims



1. An overflow warning device comprising:

input means for entering digital information;

a register having a predetermined storage capacity for storing the information entered by said input means;

a plurality of digit indicators each having a first and a second electrode for indicating the digit of the information entered in said register;

means for detecting the overflow of the information entered in said register beyond the predetermined storage capacity of said register;

means for producing indication controlling signals by which a flashing period of said indicators is determined;

a plurality of first switching means connected to selected ones of said first electrodes of said digit indicators;

a plurality of second switching means connected to selected one of said second electrodes of said digit indicators;

counting means having a plurality of bit outputs for counting the indication controlling signals;

means for applying some bit outputs of said counting means to said first switching means to control the operation of said first switching means;

means for applying other bits outputs of said counting means to said second switching means to control the operation of said second switching means; and

means for supplying power to said digit indicators through said first and second switching means whereby the digit indicators will light and extinguish intermittently and in sequence upon the occurrence of said overflow.

3,864,678

VEHICLE COLLISION ANTICIPATING DEVICE

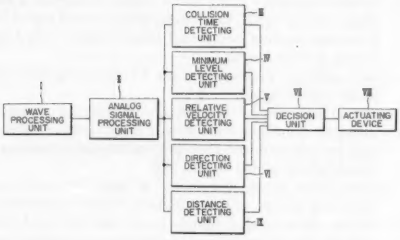
Teruo Yamanaka, Seto; Takayuki Kato, Oaza Nishiishiki; Osamu Ozeki, Nagoya; Kazuo Sato, and Minoru Bito, Toyota, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, and Toyota Jidosha Kogyo Kabushiki Kaisha, both of Aichi-ken, Japan

Filed Apr. 4, 1973, Ser. No. 347,776

Claims priority, application Japan, Apr. 8, 1972, 47-35337

Int. Cl. G01s *9/44*

U.S. Cl. 343—9 **19 Claims**



1. A vehicle collission anticipating device comprising

wave processing means for transmitting a wave by a transmitting antenna installed at a predetermined position and angle of a vehicle, for receiving a reflected wave from an object by a receiving antenna installed at predetermined position and angle of the vehicle, and for generating a low frequency wave by mixing said transmitted and reflected waves, said receiving antenna being so installed that the beam axis of said receiving antenna intersects that of said transmitting antenna in a predetermined range,

analog signal processing means connected to said wave processing means for signal processing said low frequency wave into at least one Doppler signal obtained from said low frequency wave, and for generating additional signals corresponding to the intensity and frequency of the various frequency components of said low frequency wave,

collision time detecting means connected to said analog signal processing means for detecting a collision time which is determined by a distance between the vehicle and object and a relative velocity of the object with respect to the vehicle in response to the additional signals from said analog signal processing means, and for generating a signal when said collision time reaches a predetermined time,

minimum level detecting means connected to said analog signal processing means for detecting an intensity of said Doppler signal obtained from said low frequency wave, and for generating a signal when said intensity of said Doppler signal reaches a predetermined minimum level so as to detect the object to enter a predetermined detection range defined by the positions and angles of the transmitting and receiving antennas, and

decision means connected to said collision time detecting means and minimum level detecting means for generating a signal in response to the simultaneous generation of signals by said collision time detecting means and minimum level detecting means,

thereby anticipating a collision of the object against the vehicle.

3,864,679

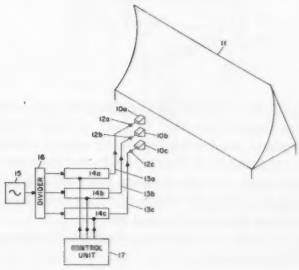
ANTENNA SYSTEM FOR RADIATING DOPPLER CODED PATTERN USING MULTIPLE BEAM ANTENNA

Peter W. Hannan, and Harold A. Wheeler, both of Smithtown, N.Y., assignors to Hazeltine Corporation, Greenland, N.Y.

Filed Apr. 3, 1973, Ser. No. 347,506

Int. Cl. G01s *1/38*

U.S. Cl. 343—106 D **16 Claims**



1. An antenna system for radiating wave energy into a desired region of space during a selected time period in a desired radiation pattern, wherein the frequency of said radiated energy within said region of space varies with at least one of the components of angular direction from said antenna system comprising:

an antenna unit capable of radiating a plurality of beams in different directions within said region of space from a common aperture, and having a plurality of wave energy input ports such that each of said ports corresponds to one of said beams;

and means for simultaneously supplying a plurality of wave energy signals during said time period, one to each of said ports of said antenna unit, each of said wave energy signals having a phase, measured with respect to the phase of the wave energy signal supplied to the port corresponding to an adjacent antenna beam, which varies during said time period between a predetermined pair of values, said variation being less than 360° and the sense of said variation being alike for pairs of antenna ports corresponding to similarly adjacent beams;

whereby when said signals are supplied to said antenna ports, said antenna radiates said desired radiation pattern.

3,864,680

ARRAY ANTENNA FOR RADIATING DOPPLER CODED PATTERN USING PHASE CONTROL

Peter W. Hannan, Smithtown, N.Y., assignor to Hazeltine Corporation, Greenland, N.Y.

Filed Apr. 3, 1973, Ser. No. 347,507

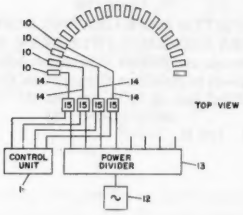
Int. Cl. G01s *1/38*

U.S. Cl. 343—106 D **16 Claims**

1. An antenna system for radiating wave energy into a region of space during a time period and in a desired radiation pattern wherein the frequency of said radiated energy within said region varies with at least one of the components of angular direction from said antenna system comprising:

an array of antenna element columns arranged along a predetermined path for radiating supplied wave energy signals, said columns comprising one or more antenna elements and means for coupling supplied wave energy signals to said elements;

means for supplying wave energy signals to said columns during said time period;



and means for controlling the phase of the individual wave energy signals supplied to each of said columns to produce phase reinforcement of the energy radiated by adjacent columns in a direction which continuously changes during said period, no two pairs of adjacent columns having the same direction of phase reinforcement at any particular time during said period;

thereby causing said antenna system to radiate said desired radiation pattern.

3,864,681

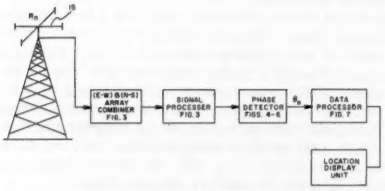
SYSTEM AND PROCESS FOR LOCATING SOURCES OF RADIATION

George A. Olive, 229 Mill Run Ct., Moorestown, N.J. 08057

Filed Feb. 28, 1973, Ser. No. 336,409

Int. Cl. G08g *5/00*; G01s *5/04*

U.S. Cl. 343—112 R **13 Claims**



1. A vehicle location system for determining the coordinate location of a vehicle through radio transmission radiation from the vehicle comprising:

a plurality of receiver sites at known coordinate locations each having antenna-coupler means providing means providing first and second signals whose phase difference is approximately linearly related to the azimuth angle of the received signal from the radiation source;

phase detector means for each receiver site responsive to the first and second signals to provide a binary expression linearly related to the phase difference between the first and second signals; and

electronic data processing means programed to determine the coordinates of the radiation source from the plurality of binary expressions.

3,864,682

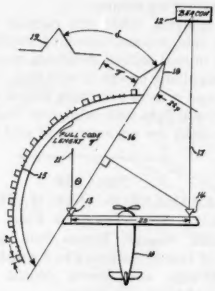
BINARY PHASE CODED NAVIGATION SYSTEM (BICONS)

James J. Maier, 37 Kellogg St., Utica, N.Y. 13323

Filed Sept. 12, 1969, Ser. No. 857,403

Int. Cl. G01s *5/02*

U.S. Cl. 343—113 R **5 Claims**



1. A binary phase coded navigation system in combination comprising:

a ground-based beacon emitting a carrier frequency, said carrier frequency being phase coded to provide a binary phase coded signal, said binary phase coded signal being a pseudo-random code, said binary phase coded signal having a code length,

a first airborne receiving means for receiving said binary phase coded signal,

a second airborne receiving means displaced from said first airborne receiving means by a predetermined distance, said second airborne receiving means also receiving said binary phase coded signal, and

a correlation means connected to said first and second receiving means, said correlation means correlating said binary phase coded signals from said first and second airborne receiving means to provide a correlation pulse.

3,864,683

ARRANGEMENT FOR AN AUTOMATIC RESETTING SYSTEM FOR MICROWAVE ANTENNAS

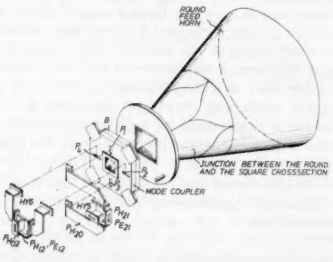
Gunter Morz, Ludwigsburg, Germany, assignor to Licentia Patent-Verwaltungs G.m.b.H., Frankfurt am Main, Germany

Filed Mar. 19, 1973, Ser. No. 342,427

Claims priority, application Germany, Mar. 17, 1972, 2212996

Int. Cl. G01s *3/14*

U.S. Cl. 343—113 R **10 Claims**



1. In an automatic direction finding system for resetting microwave antennas when signals are received from a moving

transmitter wherein the antenna exciter has a generally doubly polarizable wave-guide cross section and wherein means are provided for detecting and using the higher waveguide modes produced in the azimuth plane and in the elevational plane of the antenna exciter as the deviation information used to reset the antenna; the improvement comprising:

a transition section between said antenna exciter cross section and a waveguide with a square cross section;

a mode coupler means, which is provided with a microwave network, connected to said waveguide for separating the deviation information in the received signal from the useful signal and producing an output signal containing same; and

comparator circuit means connected to the output of said mode coupler and responsive to the output signal therefrom containing the deviation information for processing same to produce the deviation signals necessary to reset the antenna.

3,864,684

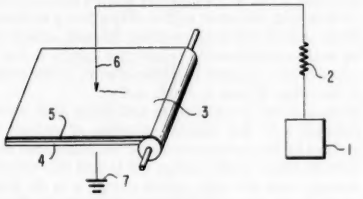
MULTICOLOR ELECTROTHERMIC RECORDING SHEET

Kazuo Shimuzu, Tokyo, Japan, assignor to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Mar. 22, 1974, Ser. No. 453,907

Int. Cl. G01d *15/34*

U.S. Cl. 346—135 **7 Claims**



1. A multicolor electrothermic recording sheet which comprises a support having thereon a layer of a metal compound which can be electrically reduced to a metal or a lower valency metallic compound in a heat sensitive element layer comprising a combination of (1) a polyhydroxy compound or a weak acid compound and (2) a color forming leuco dye which undergoes a color forming reaction upon contact with said polyhydroxy compound or said weak acid compound and a high molecular weight binder, whereby said metal compound is electrically reduced by electrothermic energy to form a metallic color and said leuco dye is thermally developed.

3,864,685

REPLACEABLE FLUID CARTRIDGE INCLUDING MAGNETICALLY OPERABLE FLUID JET DEVICES

Kenneth Henry Fischbeck, Mercer, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,127

Claims priority, application Great Britain, May 21, 1973, 24139/73

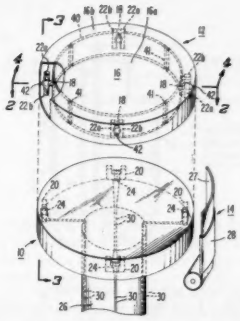
Int. Cl. G01d *15/18*

U.S. Cl. 346—140 **10 Claims**

1. An ink cartridge for an ink jet printing apparatus of the type wherein ink jets in relative motion to a recording medium are operated in response to electrical control signals to deposit drops of ink on the recording medium, comprising:

a housing member including a cavity extending substantially throughout said housing member, said cavity forming an ink reservoir for storing ink within said housing member, said housing member being adapted to be replaceably mounted on a support member; and

a magnetically operable ink jet mounted on said housing member and communicating with said reservoir to be supplied with ink from said reservoir for directing jets of ink outwardly from said housing member and on to said recording medium, said magnetically operable ink jets being operable in response to a magnetic field coupled to said magnetically operable ink jets from the support member;



said support member including magnetic means coupled to said electrical control signals for coupling said magnetic field to said magnetically operable ink jet in response to said electrical control signals;

said housing member and said support member being adapted to mate to form a magnetic field path between said magnetic means and said magnetically operable ink jet.

3,864,686

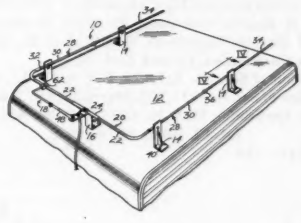
ROOF MOUNTED VEHICLE ANTENNA

William G. Owen, 7934 Napoleon Rd., Jackson, Mich. 49201

Filed Nov. 14, 1973, Ser. No. 415,538

Int. Cl. H01q *1/32*

U.S. Cl. 343—713 **5 Claims**

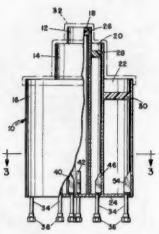


1. An antenna particularly suitable for vehicle roof mounting and Citizen Band frequency usage comprising, in combination, a U-shaped tubular antenna body having a base portion and substantially parallel leg portions, the spacing between said leg portions being one-seventh to one-eighth the wavelength of the radio frequency being transmitted, a plurality of supports connected to said leg portions for supporting said antenna body in spaced relation to a supporting surface, a base support connected to said base portion, a gamma tube assembly connected to said base support positioned in parallel spaced relationship to said base portion, an antenna conductor connected to said gamma tube, and grounding means connected to said antenna body.

3,864,687
COAXIAL HORN ANTENNA

Glenn A. Walters, Poway; Edward E. VonKline, La Mesa, and Duane Tubbs, San Diego, all of Calif., assignors to Cubic Corporation, San Diego, Calif.

Filed June 18, 1973, Ser. No. 370,612
Int. Cl. H01q 13/00
U.S. Cl. 343—778 1 Claim

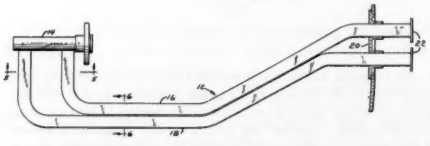


1. A coaxial horn antenna, comprising:
a plurality of at least three progressively sized tubular horns secured together in coaxial alignment and defining concentric radiating apertures at one end,
the innermost horn having a pair of feeds coupled thereto that are spaced 90° and the intermediate and outermost horns having four feeds coupled that are spaced 90°, each of said feeds having means for connection to a signal source,
said horns are axially staggered with the innermost horn extending a preset distance from said one end, and the intermediate horn extending an intermediate distance between the innermost horn and the outermost horn,
each of said feeds includes a coaxial to wave guide transition element coupled to the inner surface of the respective horn,
said means for connection comprising a coaxial conductor to said transition element,
and the ratio of cross sectional size between adjacent horns is approximately 2 to 1.

3,864,688
CROSS-POLARIZED PARABOLIC ANTENNA

Laurence H. Hansen, Oak Lawn; Robert E. Massey, Oak Forest, and Aloysius Wojnowski, Worth, all of Ill., assignors to Andrew Corporation, Orland Park, Ill.

Continuation of Ser. No. 331,172, Feb. 9, 1973, , which is a continuation of Ser. No. 237,727, March 24, 1972, abandoned.
This application Mar. 26, 1974, Ser. No. 454,814
Int. Cl. H01q 19/14, 1/16
U.S. Cl. 343—756 7 Claims

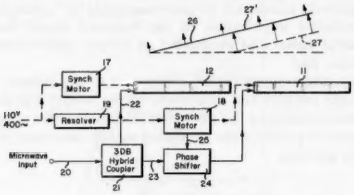


1. In a cross-polarized antenna comprising a parabolic reflector, a horn feed at the focus of the reflector, a pair of rectangular waveguides connected to the feed, the improvement characterized by the longer transverse H-plane dimension of both waveguides being aligned in a common radial plane, and the feed including a 90° polarization rotator between the point of connection of one waveguide and the point of connection of the other.

3,864,689
HYBRID SCAN ANTENNA

David W. Young, 627 N. Beachwood Dr., Burbank, Calif. 91506

Filed Aug. 2, 1973, Ser. No. 385,085
Int. Cl. H01q 3/26
U.S. Cl. 343—854 3 Claims

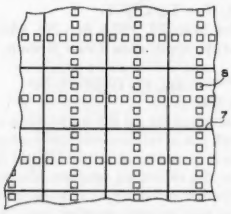


1. A hybrid scan antenna comprising, in combination:
a. at least two physically separated elongated wave guide antenna sections;
b. coupler means for receiving electromagnetic energy from a single source and dividing it to feed equal amounts to said antenna sections;
c. mechanical means for scanning radiant energy emitted by each of said antennas, said scanning being sychronized;
d. phase shift means exterior of the antenna sections including means positioned to receive the energy fed to one of said sections and shift its phase relative to the energy fed to the other of said sections; and,
e. control means connected to said phase shift means and responsive to the scanned position of radiant energy emitted by the antennas to cause the phase shift means to shift the phase of the energy fed to said one antenna in a manner such that said radiant energy is in the form of a single beam which is scanned the same as though the sections were connected end to end to form a single long continuous wave guide antenna, said phase shift means shifting the phase of energy received thereby in a continuous manner as a linear function of a varying input signal, said control means including means for deriving said varying input signal for the phase shift means from said mechanical means for scanning radiant energy.

3,864,690
MULTIFREQUENCY OPERATING RADOME

Robert Pierrot, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 1, 1973, Ser. No. 411,911
Claims priority, application France, Nov. 3, 1972, 72.38959
Int. Cl. H01q 1/42
U.S. Cl. 343—872 12 Claims



1. A multifrequency operating radome comprising:

a monolithic dielectric wall for transmitting a first wave of a first frequency and its harmonics;

a first network of continuous wires, said network being integral with said wall, for constituting with said wall an assembly tuned for a second wave to a second frequency lower than the first frequency, said network being the origin of grating lobes at the first frequency, and,

a second network of discontinuous metal elements, said second network being likewise integral with said wall, for compensating for said grating lobes; and

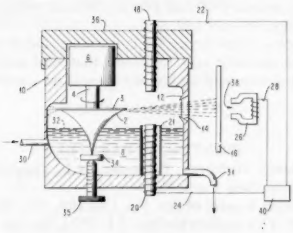
wherein the network of continuous wires and the network of discontinuous elements are printed on a dielectric substrate, said substrate subsequently being stuck to the internal face of the dielectric wall.

3,864,691

METHOD AND APPARATUS FOR PRINTING CODE PATTERNS BY NONIMPACT MEANS

Eugene Nelson Schroeder, Bethesda, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1972, Ser. No. 318,979
Int. Cl. G01d *15/12, 15/18*
U.S. Cl. 346—74.1 **5 Claims**



1. A nonimpact printer comprising:

a housing having thereon an aperture for the emission of magnetic ink and containing therein a magnetic ink reservoir;

spinning means for delivering said magnetic ink from said reservoir towards said aperture along a projected path, said spinning means being in the shape of a cone with the tip of said cone pointing downward and immersed into said reservoir and the base of said cone terminating into a thin edge positioned above said reservoir and in substantially the same horizontal plane as said aperture, to prevent clogging of said printer by magnetic particles in said magnetic ink; and

deflecting means along said magnetic ink projection path from said spinning means to said aperture to intermittently deflect said magnetic ink away from said aperture so that a document to be printed, passing adjacent to said aperture, is printed with a discernable code, said deflecting means being electromagnets controlled by electrical signals so that said magnetic ink is deflected according to said electrical signals, thereby printing said discernable code.

3,864,692

TIME DEPENDENT DEFLECTION CONTROL FOR INK JET PRINTER

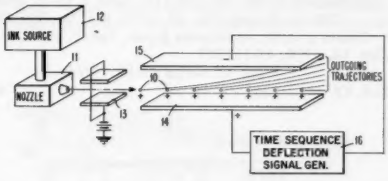
James A. McDonnell, Binghamton; Robert E. McGuire, and Raymond Radlinsky, both of Endwell, all of N.Y., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Sept. 26, 1973, Ser. No. 401,006
Int. Cl. G01d *15/18*
U.S. Cl. 346—75 **15 Claims**

1. A fluid drop control system comprising:

means for directing a series of drops of marking fluid of like deflection characteristics along a path;

selectively energizable means adjacent said path for establishing a deflection field simultaneously encompassing said drop series and having a force component transversely of said path acting to deflect said drops moving along said path; and



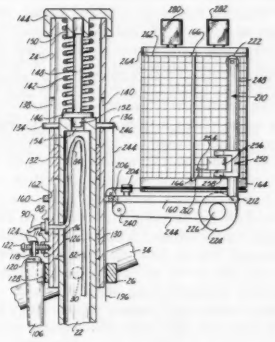
means for energizing said deflection means for a predetermined time to subject each drop in said series of drops to said transverse force for different times for unidirectional deflection and impart to each drop in said series a different trajectory from said path beyond said deflection means according to the time subjected to said force.

3,864,693

STRIP CHART RECORDING MECHANISM

Edward M. Hawes, 32418 Berkshire, Saint Clair Shores, Mich. 48082

Division of Ser. No. 286,640, Sept. 6, 1972, Pat. No. 3,797,301. This application July 10, 1973, Ser. No. 377,988
Int. Cl. G01d *9/38, 15/28*
U.S. Cl. 346—125 **2 Claims**



1. A recording mechanism comprising a rotatable drum having a removable closure for one of its ends; longitudinal slot means in the drum side wall extending from the aforementioned removable closure for a substantial portion of the drum length; chart strip storage means comprising a supply spool and a take-up spool rotatably mounted on the removable closure for disposition within the drum; an externally accessible manual operator connected to at least the take-up spool for turning same to cause the chart strip to wind off the supply spool, through the slot means, around the circumference of the drum, and back through the slot means onto the take-up spool; the aforementioned closure and spools being removable from the drum as a unit to remove and replace the chart, the longitudinal slot means having a mouth communicating with said one end of the drum to accommodate movement of the

chart strip into the slot means during the chart replacement process.

3,864,694

RECORDING INSTRUMENTS

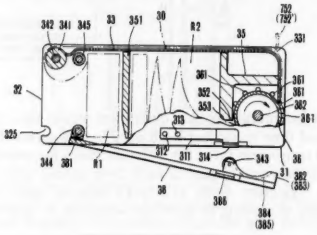
Sadao Tamura, Tokyo, Japan, assignor to Yokogawa Electric Works, Limited, Tokyo, Japan

Continuation of Ser. No. 130,715, April 2, 1971, abandoned. This application Feb. 28, 1973, Ser. No. 336,480

Claims priority, application Japan, Apr. 7, 1970, 45-29016; Dec. 14, 1970, 45-111507

Int. Cl. G01d *15/30, 15/16*

U.S. Cl. 346—136 **9 Claims**



4. A cassett-type recording instrument for a Z-folded paper stack comprising: a frame, torque generating means and torque transmission means on said frame; a cassette removably mounted on said frame, said cassette having: a housing enclosing a rectangular volume with internal dimensions corresponding to the sheet size of said stack and subdivided by a transverse wall to define first and second internal regions having said internal dimensions to accept and confine the edges of separate stacks of Z-folded paper, recording paper feed means at one end of said housing, said recording paper feed means being cooperatively connected to said torque transmission means when said cassette is mounted on said frame as as to be rotated, a turning guide at the other end of said housing positioned to guide a continuous web of Z-folded recording paper which is stored in said first internal region of said cassette and engaged with said recording paper feed means so as to be drawn from said first region over said turning guide and fed in an unfolded condition over the outer surface of said cassette, deflecting guide means mounted at said one end of said housing and forming an end wall for said second region adjacent said feed means, said end wall forming a slot through which said feed means propells said web through said slot to be projected past said deflecting guide approximately normal to the surface of said transverse wall and refolded within said second region solely by the force of projection through said slot; and means mounted on said frame at a position opposed to said outer surface for recording a measured quantity on the recording paper while it is unfolded.

3,864,695

PEN HAVING VERTICAL MOVEMENT CONTROL

Hironobu Nagashima, and Masato Hara, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Sept. 4, 1973, Ser. No. 393,888

Claims priority, application Japan, Sept. 14, 1972, 47-107261[U]; Sept. 25, 1972, 47-111195[U]

Int. Cl. G01d *15/24*

U.S. Cl. 346—139 R **16 Claims**

1. A device for producing the vertical movement of a pen in a scribing apparatus comprising:

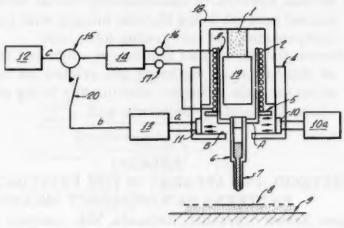
a frame member;

a movable coil mounted on said frame member;

means attached to said frame member for holding said pen;

means electrically connected to said movable coil for supplying a drive current to move said coil;

a first magnetic pole piece located within said frame member;



a second magnetic pole piece located outside of said frame member, said coil having a winding width greater than the longitudinal width of said first pole piece, so that the writing pressure of said pen is constant within the movable range of said coil; and

a feedback control device for controlling said drive current to said movable coil to insure that said pen makes a proper stroke with no bounce thereof on a work surface.

3,864,696

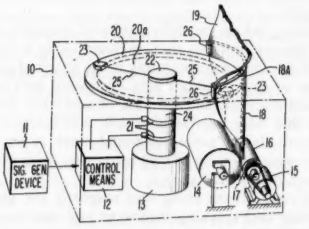
PRINTING APPARATUS

Kenneth Henry Fischbeck, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 192,209, Oct. 26, 1971, abandoned. This application Nov. 12, 1973, Ser. No. 414,756

Int. Cl. G01d *15/18*

U.S. Cl. 346—140 **5 Claims**



1. A printing apparatus wherein ink is deposited onto a recording medium in response to electrical control signals comprising:

a shaft;

means for rotatably driving said shaft about its axis;

a circular disc member coaxially and replaceably mounted on said shaft to be rotated by said shaft;

an electrically operable metering ink jet mounted at the periphery of said disc member for directing jets of ink drops radially outward from said disc, said ink jet being of the type susceptible to the formation of bubbles;

said disc member being arranged to serve as a replaceable ink cartridge wherein said disc member includes a cavity extending substantially throughout said disc member and located generally radially inward from said ink jet, said cavity forming an ink reservoir for storing said ink within said disc member and adapted to supply ink to said ink jet;

said bubbles being urged radially inward in response to a pressure gradient established by centrifugal forces acting on said ink when said disc member is rotated;

means responsive to said electrical control signals for controlling said ink jets to provide jets of ink drops in accordance with the information manifested by said signals;

a warped surface guide member formed of a warped surface having a straight line portion at one end and a curved line portion at the opposite end, said curved line portion of said guide member being conformed to the circular periphery of said disc member and proximate therefrom;

means for driving said recording medium contiguously through said guide member over said straight line portion to egress over said curved portion conforming said recording medium to the warped surface of said guide member as said recording medium is guided past the circular periphery of said disc member.

3,864,697

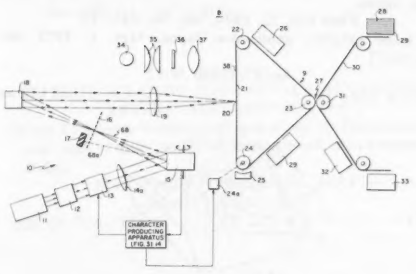
NON-IMPACT PRINTER

Peter L. P. Dillon, Rochester, and Donald C. Hoesterey, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 25, 1973, Ser. No. 382,609

Int. Cl. B41b *13/00*

U.S. Cl. 354—5 **10 Claims**



1. A non-impact printing apparatus for recording information from a source onto a receiving medium, comprising:

a. optical character generating means including a simultaneous multi-beam acoustooptic cell coupled to said source and responsive to the information therein for simultaneously producing a plurality of light beams which have such information;

b. movable mirror scanning means for scanning and reflecting the light beams: and

c. electrographic apparatus for receiving the reflected beams to reproduce the information in said light beams on such medium.

3,864,698

OPTICAL LIGHTING INSTRUMENT

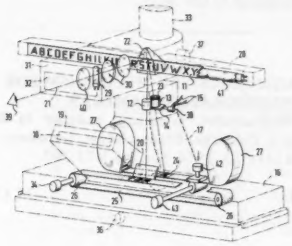
Bernd Holthusen, Hamburg, Germany, assignor to Dr. Boger Photosatz GmbH

Filed Sept. 14, 1972, Ser. No. 288,946

Int. Cl. B41b *27/38*

U.S. Cl. 354—5 **10 Claims**

1. In an optical lighting instrument for composing symbols on a photosensitive material, which includes a light source, a photosensitive material and a phosphorescent material in coplanar adjacent relationship, a symbol carrier, optical means for imaging a symbol movable by the carrier into a focal plane of the optical means individually onto the photosensitive and phosphorescent materials, the imaging onto the phosphorescent material serving to provide a visible image identical to that recorded by the photosensitive material at least until a subsequent symbol is imaged, so that a desired relationship of successive symbols can be set utilizing visual observation, and the symbol carrier and light source on one hand and the optical means on the other hand being relatively movable in the direction of the optical axis of said optical means, the improvement wherein said optical means includes two objective elements movable in common in the direction of the optical axis which image a symbol from the symbol carrier at two adjacent coplanar spaced positions, the imaged symbols being of equal size and non-overlapping, the photosensitive material is located at one of said spaced positions and



the phosphorescent material at the other, a shutter is arranged to selectively obstruct rays passing through the objective element that image onto the photosensitive material and is adapted to be opened for a predetermined time for recording an image on the photosensitive material, and wherein means is included to regulate the intensity of the rays that image onto the phosphorescent material between a setting intensity, by which no visible trace is left behind on the phosphorescent material, and a much stronger intensity which by acting for a predetermined time, brings out an easily visible phosphorescence.

3,864,699

AUTOMATIC EXPOSURE CONTROL SYSTEM FOR TTL METERING TYPE SINGLE-LENS REFLEX CAMERA

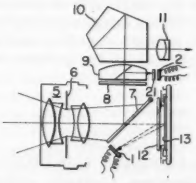
Tokuichi Tsunekawa, Yokohama, and Soichi Nakamoto, Goro Hasegawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 6, 1973, Ser. No. 394,750

Claims priority, application Japan, Sept. 11, 1972, 47-91090

Int. Cl. G03b *7/08*

U.S. Cl. 354—31 **3 Claims**



1. An automatic exposure control system for a through-the-lens photometry type single-lens reflex camera comprising:

a finder optical system having a movable mirror;

a first photoelectric converter element having a surface for receiving a light flux passing through said finder optical system;

a second photoelectric converter element disposed outside of the light path of said finder optical system and having a surface for receiving a light flux reflected by at least one of a shutter curtain and a film surface, the electrical response properties of the second photoelectric converter

element being selected to be substantially the same as those of the first photoelectric converter element and those two elements being connected in parallel with each other; and

means for controlling the exposure including said parallel-connected first and second photoelectric converter elements and controlling the exposure by simultaneously utilizing the response rise property of said first photoelectric converter element and the response fall-off characteristic of said second photoelectric converter characteristic during transfer of exposure control from one of said converter elements to the other.

3,864,700

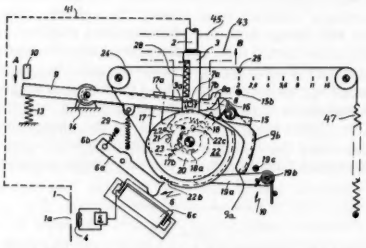
DIAPHRAGM ADJUSTING MECHANISM FOR PHOTOGRAPHIC CAMERAS

Bodo Mielke, Wolfenbuttel, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed May 20, 1974, Ser. No. 471,367

Int. Cl. G03b *7/08*

U.S. Cl. 354—43 **17 Claims**



1. Exposure controlling mechanism for photographic cameras, comprising a diaphragm having an adjustable aperture, an aperture value storage member movable to different positions representing different diaphragm apertures, diaphragm drive means effective upon actuation to close the diaphragm down from maximum aperture to minimum aperture, positioning means including a photoelectric converter effective during the closing down of the diaphragm to position said storage member in a position representing an optimum aperture for an exposure, and return means for opening the diaphragm up to an aperture corresponding to the position of said storage member.

3,864,701

AUTOMATIC EXPOSURE CONTROL CIRCUIT

Gerhard Krause, Edersberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

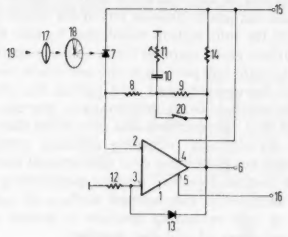
Filed Mar. 2, 1973, Ser. No. 337,727

Claims priority, application Germany, Mar. 7, 1972, 2210958

Int. Cl. G03b *7/08*

U.S. Cl. 354—49 **12 Claims**

1. In a camera having a shutter and a device, means for exposing said photoresponsive device to light from a scene to be photographed, and means for varying the amount of such exposure during the open period of said camera shutter the combination comprising an amplifier with high pass characteristic, means for connecting an input of said amplifier with said photoresponsive device, and a threshold value detector connected with the output of said amplifier and adapted to respond to the signal produced at the output of said amplifier to



produce a control signal adapted for use in effecting the setting of the exposure of the camera.

3,864,702

LIGHT MEASURING OPTICAL SYSTEM FOR USE IN A REFLEX CAMERA

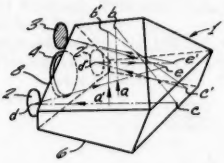
Takahiro Sugiyama, and Michiro Oishi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Feb. 22, 1974, Ser. No. 444,722

Claims priority, application Japan, Mar. 1, 1973, 48-26156[U]

Int. Cl. G03b *19/12*

U.S. Cl. 354—56 **8 Claims**



1. A light measuring optical device for use with a reflex camera, said device comprising:

a pentaprism mounted on said camera, said pentaprism having a first surface for receiving said light and a second surface for exiting said light;

a reflecting mirror mounted adjacent said second surface of said pentaprism, said reflecting mirror diverting said light back into said pentaprism; and

a detector element for measuring light intensity mounted adjacent said pentaprism to receive said light after it has been diverted back into said pentaprism.

3,864,703

PHOTOGRAPHIC APPARATUS

Nicholas Gold, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 375,500, July 2, 1973,. This application June 3, 1974, Ser. No. 475,627

Int. Cl. G03b *17/50*

U.S. Cl. 354—86 **5 Claims**

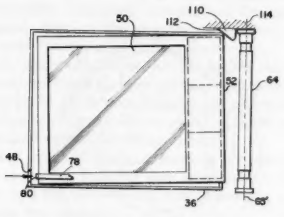
1. Photographic apparatus for use with a film unit having leading and trailing edges separated by a substantially rectangular viewing area comprising:

means for locating the film unit in position for exposure;

pressure-applying means adapted to define a longitudinally extending gap through which the film unit is adapted to be advanced, subsequent to exposure, to spread a processing composition across a photosensitive layer of the film unit;

means for mounting said pressure-applying means with said longitudinally extending gap and the leading edge of the film unit being parallel with each other;

means for canting the film unit as it is advanced from said exposure position toward said pressure-applying means such that the leading edge of the film unit defines an acute angle with said longitudinally extending gap; and



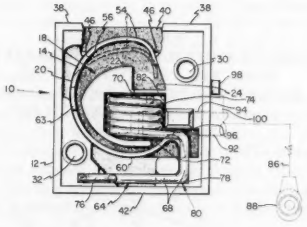
means for recanting the film unit such that its leading edge is substantially parallel with said longitudinally extending gap prior to moving into said gap, whereby the processing composition is spread over an area substantially coextensive with the viewing area.

3,864,704

PHOTOGRAPHIC FOOT ATTACHMENT WITH RETRACTABLE HOT CONTACT

David C. Smart, Westminster, and Dean M. Peterson, Littleton, both of Colo., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 20, 1973, Ser. No. 399,276
Int. Cl. G03b *15/05*
U.S. Cl. 354—126 **3 Claims**



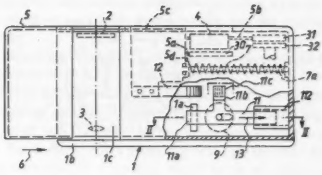
1. In combination, an electrical plug and a mounting base for an electronic flash unit, said base having a retractable hot center contact, said base comprising a housing having a wall portion of insulative material, said contact comprising an electrically conductive spring mounted in said housing and having a coil portion and a hot contact portion connected to said coil portion, said housing having first and second openings in said wall portion, said hot contact portion extending through said first opening in a first position and being retracted inside said housing in a second position; said coil portion being positioned relative to said second opening such that insertion of said plug through said second opening to contact and displace said coil portion effects movement of said hot contact portion from said first position to said second position.

3,864,705

PHOTOGRAPHIC APPARATUS WITH EXPANSIBLE HOUSING

Alfred Winkler, Munich, Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 23, 1973, Ser. No. 344,366
Claims priority, application Germany, Mar. 27, 1972, 2214955
Int. Cl. G03b *17/04, 19/04*
U.S. Cl. 354—187 **14 Claims**

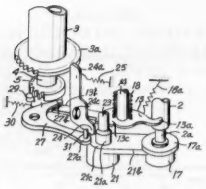


1. In a photographic apparatus, particularly in a still camera, a combination comprising an elongated housing including a first section and a second section supported by and movable relative to said first section in the longitudinal direction of said housing between first and second positions in which one of said sections respectively conceals and exposes a portion of the other of said sections and in which the overall length of said housing is respectively reduced and increased; picture taking lens means and view finder means in said other section, at least one of said means being installed in said portion of said other section so that said one means is at least partially concealed in said first position of said second section; film transporting means mounted in one of said sections and being operable to transport the film in response to movement of said second section between said first and second positions thereof; resilient means reacting against said first section and arranged to bias said second section to said second position so that the movement of said second section to said first position takes place against the opposition of said resilient means and said resilient means at least assists the movement of said second section to said second position; detent means for said second section, said detent means having a member movable to an inoperative position in which said second section can be moved, as often as desired, relative to said first section between said first and second positions thereof, and said member of said detent means being further movable, in either position of said second section, to an operative position in which said second section is locked in said first position against movement from said first position under the action of said resilient means as long as said member of said detent means is located in said operative position while said second section assumes said first position thereof; and actuating means operable by hand to move said member of said detent means from said inoperative to said operative position or from said operative to said inoperative position, said actuating means having a first position of rest which corresponds to said operative position of said member of said detent means and from which said actuating means must be moved by hand in order to move said member of said detent means from said operative position, and said actuating means further having a second position of rest which corresponds to said inoperative position of said member of said detent means and from which said actuating means must be moved by hand in order to move said member of said detent means from said inoperative position.

3,864,706
MULTIPLE EXPOSURE STRUCTURE FOR CAMERAS

Fumio Urano, Wako, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed July 26, 1973, Ser. No. 382,878
Claims priority, application Japan, July 28, 1972, 47-75148
Int. Cl. G03b 19/04
U.S. Cl. 354—209 9 Claims

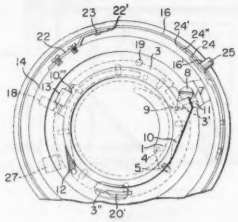


1. In a camera, film-transporting means, transmission means for transmitting movement to said film-transporting means, clutch means operatively connected between said transmission means and film-transporting means and having an engaged position for transmitting movement between said transmission means and film-transporting means and a disengaged position for preventing transmission of movement from said transmission means to said film-transporting means, take-up spool means for taking up exposed film, connecting means connecting said transmission means to said spool means for turning the latter except when said spool means is blocked against movement, blocking means having a non-blocking position freeing said spool means to be turned by said transmission means and a blocking position engaging said spool means to block the latter against movement when said transmission means operates, and manually operable means having a rest position at which said blocking means is in said non-blocking position thereof and said clutch means is in said engaged position thereof, said manually operable means having a rewind position cooperating with said clutch means for placing the latter in said disengaged position thereof while said blocking means still remains in said non-blocking position thereof, and said manually operable means having a multiple exposure position cooperating both with said blocking means and said clutch means for placing said blocking means in said blocking position thereof and said clutch means in said disengaged position thereof so that in said multiple exposure position of said manually operable means said transmission means may be operated simultaneously with cocking of a shutter of the camera without transporting film while when said manually operable means is in said rewind position thereof film may be rewound from said take-up spool back into a film cartridge, said transmission means acting through said clutch means, when the latter is engaged, on said film-transporting means for transporting film frame-by-frame during successive operating cycles of said transmission means, respectively, and safety means cooperating with said manually operable means for preventing the latter from assuming said multiple exposure position except at the end of one complete operating cycle of said transmission means when transportation of a complete frame has been completed and the next operating cycle for transporting the next film frame has not yet started.

3,864,707
INTERCHANGEABLE LENS WITH A STOP PRESET DEVICE

Takayuki Shirasaki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1973, Ser. No. 391,853
Claims priority, application Japan, Sept. 6, 1972, 47-89217
Int. Cl. G03b 9/07
U.S. Cl. 354—271 2 Claims

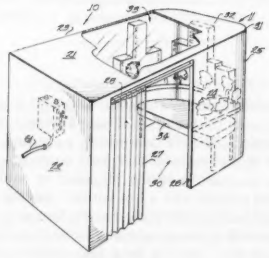


1. Aan interchangeable lens for a camera provided with a stop preset device, comprising:
- a variable aperture stop;
- a cam member for presetting said stop;
- a member for automatic stop presetting, said member being engageable with said cam member;
- a manually operating member having a manual stop presetting position range, wherein said cam member is adjusted by said manually operating member, and an automatic stop presetting position wherein said cam member is freed from said manually operating member and is caused to be subject to adjustment through said automatic stop presetting member, by an exposure meter provided in the camera;
- means for limiting said operating member to positions within the manual stop presetting position range, and
- means for releasing said operating member from the limiting means and permitting the operating member to be shifted to the automatic stop presetting position.

3,864,708
AUTOMATIC PHOTOGRAPHIC APPARATUS AND POSTCARD VENDING MACHINE

Brian S. Allen, P.O. Box 611, Ironton, Ohio 45638

Filed Dec. 4, 1973, Ser. No. 421,589
Int. Cl. G03b 15/00
U.S. Cl. 354—290 1 Claim



1. A coin or token operable automatic photographic apparatus and postcard vending machine for the taking, developing and vending of photographs in a picture postcard format, the apparatus comprising, in combination.

a cubicle accessible to an individual using the apparatus and having a horizontal top wall surface, a vertical back wall surface, a vertical front wall surface forming a picture end wall surface, and a pair of vertically extending closed sidewall surfaces interconnecting adjacentmost edges of the vertical front and back wall surfaces;

a compartment defined interiorly of the cubicle between the wall surfaces;

a doorway defined in one of the side wall surfaces providing ingress and egress of the cubicle compartment;

a horizontally extending curtain rod disposed along the topmost edge of the doorway extending between the opposite vertical edges of the doorway;

a curtain suspended from the rod within the doorway and slidably operable thereon between a position opening the doorway to provide access to the compartment and a position closing the doorway to provide privacy to an individual within the compartment;

the front end wall surface forming the picture end wall surface having rounded side edges which bend contiguously into the sidewall surfaces to provide a smooth continuous background;

a panoramic scene of the scenery around the cubicle disposed on the picture end wall surface extending completely across the rounded edges thereof to provide a smooth panoramic scenery background;

a bench forming seat extending transversely of the compartment between the side wall surfaces and having a curved back to fit snugly against the curved picture end wall surface in a position immediately beneath the panoramic scenery, the seat intended for use by an individual to sit on the same during the picture taking procedure with the portion of the individual's body above the individual's waist projecting in front of the panoramic scenery background;

a camera of the self-developing Polaroid type wherein an exposed picture is developed automatically upon being dispensed from the camera;

a hollow box-like housing affixed to the interior of the compartment's back wall surface and having a top surface, a bottom surface, a front surface, a back surface, and opposed side wall surfaces;

a chamber defined interiorly of the hollow box-like housing within the surfaces thereof;

an aperture disposed in the front wall surface of the housing and in communication with the chamber, the aperture being in a position above said seat to provide a line of vision through the aperture to the panoramic scenery background;

said camera mounted within said housing chamber with the lens of the camera in alignment with said aperture to provide a free line of vision to the lens and at a level spaced vertically above the bottom of the cubicle compartment selected for appropriate field of vision viewing of the lens in a manner to encompass an individual sitting on the seat and the panoramic scene behind the individual;

said lens having an adjustable focal lens to vary the field of vision thereof between a close-up position where only the individual will be on the photograph taken by the camera and a panoramic scene position where both the individual and the surrounding panoramic scene will be within the field of vision of the lens and be imprinted on the photograph taken by the camera;

a knob rotatively mounted on the exterior of said housing top surface for rotation about its axis;

a linkage assembly interconnecting said knob to said camera lens for adjusting said lens relative to the rotation of said knob between said close-up and said panoramic scene position;

a timer adjustable from zero to thirty seconds;

a knob rotatively mounted on the exterior of the housing top surface and projecting outwardly therefrom and rotatable about its axis;

a shutter associated with the camera lens and operable from a position exteriorly of the camera;

a linkage assembly interconnecting the timer to the camera shutter mechanism to provide operation of said shutter by said timer;

a drive mechanism interconnecting said second mentioned knob to said timer for adjustively setting said timer between a shutter actuating position and zero to thirty second time delay position providing a selective adjustment to an individual in the cubicle compartment for selecting the desired time delay for actuation of the camera shutter mechanism to provide sufficient time for the individual to pose and seat themselves on the bench seat prior to the picture being taken by the camera;

the rotation of said second mentioned knob to the desired time delay position activating the timer for the set period of time with said shutter mechanism being activated upon expiration of said time delay period for the taking of the picture;

a slot extending vertically in the side surface of the housing in communication with the chamber;

a photograph dispensing lever operatively associated with the camera to effect dispensing of the photographs therefrom with the free end of the lever projecting outwardly from the camera and extending through the slot, the lever being movable in a vertical blade from an initial position downward to a dispensing position;

a vertically disposed dispensing slot provided in the housing side wall surface adjacent the dispensing lever slot;

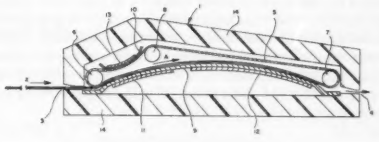
the movement of the dispensing lever effecting the dispensing of the exposed photograph from the camera outwardly of the camera housing for delivery to an individual with the photograph being in a picture postcard type format having a rigid cardboard backing suitable for use in the mails.

3,864,709

APPARATUS FOR PROCESSING RECORDING MATERIAL

Andrew Reiner Bruns, Beaverton, Oreg., assignor to Textronix, Inc., Beaverton, Oreg.

Filed Oct. 4, 1973, Ser. No. 403,690
Int. Cl. G03d *3/00*
U.S. Cl. 354—297 **1 Claim**



1. An apparatus for processing dry silver recording material, comprising:

insulated housing means having an input opening through which the recording material is introduced into said insulated housing means and an output opening out of which the recording material is extracted from said insulated housing means;

first platen means disposed in said insulated housing means extending from said input opening to said output opening along which the recording material moves;

heating means provided on said first platen means for heating said first platen means therealong for developing information on the recording material;

continuous belt means disposed in said insulated housing means;

roller means disposed in said housing means including input roller means adjacent said input opening, output roller means adjacent said output opening, and intermediate roller means between said input roller means and said

output roller means, said continuous belt means movably mounted onto said input roller means, output roller means, and said intermediate roller means, said continuous belt means adapted to be moved via said roller means so that said continuous belt means engages said first platen means thereby frictionally moving the recording material along said first platen means;

second platen means disposed in engagement with said continuous belt means between said input roller means and said intermediate roller means; and

heater means provided on said second platen means for heating said second platen means which heats said continuous belt means above the temperature of said first platen means whereby said continuous belt means raises the temperature of the emulsion side of the recording material to development temperature at a fast rate.

3,864,710

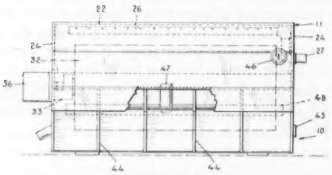
PHOTOGRAPHIC PROCESSING APPARATUS

Edward F. Zuber, R.R. No. 2, Lyndhurst, Ontario, and Udo F. Rumpf, 1710 John St., Thornhill, Ontario, both of Canada

Filed Dec. 3, 1973, Ser. No. 421,332

Int. Cl. G03d *17/00*

U.S. Cl. 354—316 **11 Claims**



1. An apparatus for processing photographic sheet material comprising a light-tight housing, a tray-like container for processing solution mounted in the housing, a rotary carrier providing a cylindrical support surface journalled in said housing for rotation about a horizontal axis, and a plurality of discrete attachment means distributed over said support surface for engagement with the rear side only of sheet material carried by the rotary carrier whereby to hold said material to said surface, said attachment means comprising a plurality of suction cups mounted on the carrier and uniformly distributed over a major sector of said cylindrical support surface, the carrier being positioned in relation to the tray-like container so as to contact the sheet material with the processing solution as the drum rotates.

3,864,711

CAMERA CARRYING CASE

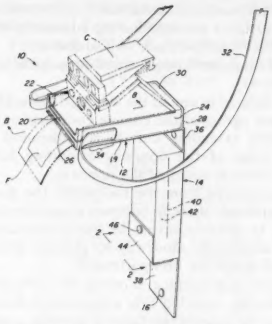
Donald H. Matthews, Quaker Bottom Rd., Sparks, Md. 21152

Filed Jan. 24, 1974, Ser. No. 436,083

Int. Cl. G03b *17/56*

U.S. Cl. 354—354 **8 Claims**

1. A camera carrying case comprising a substantially rigid rectangular case body with front, rear, bottom, top and sides, the top having an opening therein for receiving a camera and rearwardly forming with the sides, bottom and rear a socket for retaining self-developing type camera received in said opening, the front comprising a transverse bar connecting the sides, with an opening therebelow located for registration with the picture ejection opening of a self-developing type camera when carried in said case and the upper portion of the transverse bar bounded by the top opening, the bottom having a discontinuous portion forwardly therein comprising a full width yielding portion extending rearwardly along a substantial portion of the length of the case body for permitting downward motion of a portion of a said self-developing type camera during operation thereof, a cover proportioned for covering



all said openings, and means for hinging the cover to the case body at the rear.

3,864,712

PHOTOGRAPHIC CAMERA FOCUSING SCREEN CARRIER

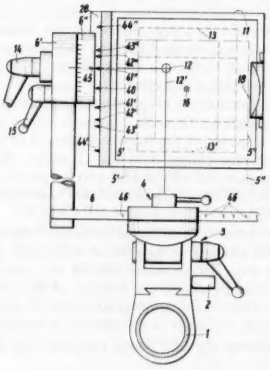
Helmuth von Stwolinski, Zurich, Switzerland, assignor to Anstalt, Studio Gesellschaft fur Industrie-und Modephotographie, Vaduz, Liechtenstein

Filed June 7, 1972, Ser. No. 260,407

Claims priority, application Germany, Sept. 3, 1971, 2144262; Sept. 3, 1971, 7133731

Int. Cl. G03b *13/24*

U.S. Cl. 354—354 **17 Claims**



1. In a photographic camera, more particularly a focusing screen camera, having, between an objective carrier and an emulsion or focusing screen carrier, an extension adjustable along a camera bed, in which camera at least the focusing screen carrier is pivotable about two mutually perpendicular pivoting axes intersecting in the plane of the focusing screen, the improvement in which: the focusing screen carrier is linearly displaceable relative to each of the pivoting axes defined by pivoting devices in the direction of the respective other pivoting axis and over the entire image plane, so that the point of intersection of the axis in the image plane of the focusing screen is selectable over the area of the focusing screen; and in which the carrier is mounted on a standard having at least one vertical and one horizontal arm and provided on its, in normal position of use, vertical arm with the pivoting device defining the first, normally horizontal, pivoting axis, relative to

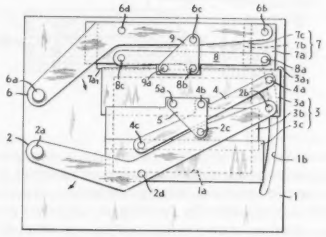
the rotatable portion of which pivoting device the carried is linearly displaceable; and the other, in normal position of use, horizontal arm of the standard is connected to the camera bed via the second pivoting device defining the second pivoting axis, and is laterally linearly displaceable relative to the second pivoting device.

3,864,713

FOCAL PLANE SHUTTER BLADE SUPPORT DEVICE

Kiyoshi Kitai, Tokyo; Eiichi Onda, Misato; Mitsuo Koyama, and Tadashi Nakagawa, both of Yotsukaido, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed May 8, 1973, Ser. No. 358,261
Claims priority, application Japan, May 8, 1972, 47-053480
Int. Cl. G03b *9/42, 9/16*
U.S. Cl. 354—246 **3 Claims**



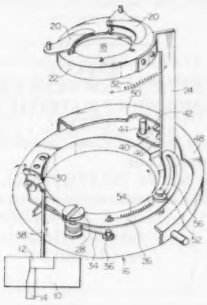
1. In a focal plane shutter, support means having a shutter aperture, a first plurality of shutter-opening blades closing the shutter when in a cocked condition, a first parallel link mechanism comprising two parallel link mechanism comprising two parallel links and said shutter-opening blades for supporting and operating the blades from a shutter-closing position to a shutter-opening position, a second plurality of shutter-closing blades disposed in a superposed relationship clear of said exposure aperture when said cocked condition exists and operable to a shutter-closing position closing the shutter aperture, a second parallel link mechanism comprising two parallel links and said shutter-closing blades for supporting and operating the shutter-closing blades, each of the first plurality of shutter-opening blades and said second plurality of shutter-closing blades having a slit-defining shutter blade having a straight edge for defining a slit of varying width as the shutter aperture is opened, and closed, each link mechanism comprising a rotationally driven main link and an auxiliary link parallel with a portion of said main link, each link mechanism haing a plate pivotally supporting the auxiliary link on a respective main link, each said plate mounting the slit-defining blade of its corresponding plurality of shutter blades on a corresponding auxiliary link, pivot means rotatably supporting the main link only of each link mechanism independently on said support means on a common side of said shutter aperture, a guide on each of the parallel links of each link mechanism for maintaining each respective straight edge of a corresponding slit-defining shutter blades in a plane normal to a medial plane passing through said aperture, and an arcuate slot on said support means within which said guide means are guided during travel of the slit-forming shutter blades.

3,864,714

LENS STOP-DOWN MECHANISM

Saburo Sasaki, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Mar. 18, 1974, Ser. No. 451,822
Claims priority, application Japan, Apr. 2, 1973, 48-37705
Int. Cl. G03b *9/07*
U.S. Cl. 354—272 **13 Claims**



1. A stop-down mechanism for a lens having adjustable aperture means urged by biasing means toward a maximum open position, comprising:

stopper means being manually adjustable to engage with the aperture means and limit movement thereof away from the maximum open position to a position corresponding to the desired aperture setting;

actuating means arranged to move the aperture means from the maximum open position to the position corresponding to the desired aperture setting when manually actuated; and

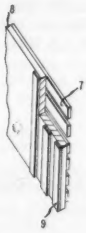
inertial mass means arranged to be accelerated by movement of said actuating means and transfer kinetic energy to the aperture means in substantial simultaneity with the engagement thereof with said stopper means in a direction to cancel the force of rebound of the aperture means from the stopper means.

3,864,715

DIODE ARRAY-FORMING ELECTRICAL ELEMENT

Sebastian Vito Rocco Mastrangelo, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1972, Ser. No. 317,382
Int. Cl. H01l *19/00*
U.S. Cl. 357—1 **15 Claims**



1. A layered electrical element which comprises:

a. an activatable electrode composition consisting essentially of an insulating binder having insulatively coated metal particles dispersed therein, with the particles and binder together constituting an insulator in the unactivated state but being capable of becoming electrically conductive on exposure to an activating potential, and

b. a semiconductor component disposed in an insulating binder in contact with (a),

said layered element presenting a first surface and a second opposing surface and a volume therebetween which are normally non-conductive, said element being normally insulative but capable of exhibiting rectifying properties with respect to current flow between said surfaces upon electrical activation, said surfaces being capable of remaining laterally non-conductive and said volume being capable of becoming conductive between said surfaces on exposure to said activating potential.

3,864,716

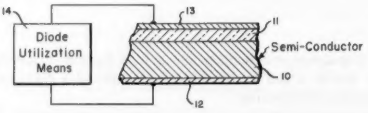
RECTIFYING JUNCTION DEVICE EMPLOYING A GLASSY AMORPHOUS MATERIAL AS AN ACTIVE LAYER

Seymour Merrin, Fairfield, Conn., assignor to Innotech Corporation, Norwalk, Conn.

Division of Ser. No. 227,933, Feb. 22, 1972, Pat. No. 3,801,879, which is a continuation-in-part of Ser. No. 122,420, March 9, 1971, abandoned. This application Nov. 13, 1973, Ser. No. 415,433

Int. Cl. H01l *3/00*

U.S. Cl. 357—2 **21 Claims**



1. A semiconductor junction device of the type comprising a first semiconducting (active) layer of material having one type of electronic conductivity and, disposed in contact with said first semiconducting layer forming a rectifying (diode) junction therewith, a second semiconducting (active) layer of material having the other type of electronic conductivity, said device characterized in that at least one of said semiconducting (active) layers of material is a (an insulating) layer of noncrystalline glassy amorphous material having a specific resistivity in excess of about 10^{12}ohm-cm.

3,864,717

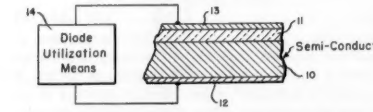
PHOTORESPONSIVE JUNCTION DEVICE EMPLOYING A GLASSY AMORPHOUS MATERIAL AS AN ACTIVE LAYER

Seymour Merrin, Fairfield, Conn., assignor to Innotech Corporation, Norwalk, Conn.

Division of Ser. No. 227,933, Feb. 22, 1972, Pat. No. 3,801,879, and a continuation-in-part of Ser. No. 122,420, March 9, 1971, abandoned. This application Nov. 13, 1973, Ser. No. 415,434

Int. Cl. H01l *15/00*

U.S. Cl. 357—2 **17 Claims**



1. A photoresponsive junction device for sensing light of given intensity comprising:

a semiconducting substrate having one type of electronic conductivity;

disposed upon said semiconducting substrate and forming a rectifying junction therewith, a layer of glass having the other kind of electronic conductivity from that of said substrate, said layer being sufficiently thin to possess a useful level of conductivity;

said device possessing a reverse bias breakdown voltage which is dependent upon the presence or absence of light; and

means for applying across the junction between said layer and said substrate a bias voltage of a value between the breakdown voltage of the junction in the absence of light and the breakdwon voltage in the presence of light of said given intensity.

3,864,718

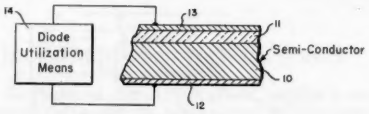
MULTIPLE JUNCTION DEVICE EMPLOYING A GLASSY AMORPHOUS MATERIAL AS AN ACTIVE LAYER

Seymour Merrin, Fairfield, Conn., assignor to Innotech Corporation, Norwalk, Conn.

Division of Ser. No. 227,933, Feb. 22, 1972, Pat. No. 3,801,879, which is a continuation-in-part of Ser. No. 122,420, March 9, 1971, abandoned. This application Nov. 13, 1973, Ser. No. 415,435

Int. Cl. H01l *3/00*

U.S. Cl. 357—2 **9 Claims**



1. A multiple junction device of the type comprising at least three successive semiconducting layers of material, said successive layers of material having alternating types of electronic conductivity thereby forming at least two successive rectifying junctions thereamong, said device characterized in that at least one of said semiconducting layers is a layer of a glassy amorphous material.

3,864,719

SEMICONDUCTOR DEVICES HAVING NEGATIVE RESISTANCE AND STEPPED VOLTAGE-TO-CURRENT CHARACTERISTICS

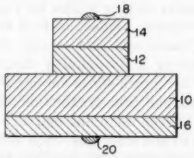
Shigeyuki Uematsu, and Haruhiko Abe, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 269,241, July 5, 1972, abandoned. This application Oct. 5, 1973, Ser. No. 403,781

Claims priority, application Japan, July 7, 1971, 46-50042; July 9, 1971, 46-50786

Int. Cl. H01l *11/00, 15/00*

U.S. Cl. 357—4 **6 Claims**



1. A semiconductor device receptive in operation of a reverse bias potential thereacross comprising means developing in operation a stepped voltage-to-current characteristics wherein said means developing said stepped voltage-to-current characteristic comprises, a substrate of semiconductive material selected from a group consisting of silicon and germanium having an impurity concentration from about 10^{14} to 10^{16} atoms per cubic centimeter and having a pair of opposite major surfaces, a thin film of a nitride of a valve metal

selected from a group consisting of molybdenum, tantalum, tungsten, titanium, and niobium disposed on a major surface of said substrate and being from about 100 to 10,000 A. thick, a first electrode comprising a layer of conductive material disposed on a major surface of said substrate opposite said major surface bearing said thin film, and a second electrode comprising a layer of conductive material disposed on said thin film.

3,864,720

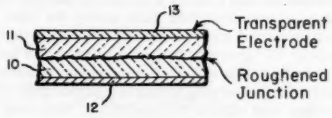
LIGHT EMITTING JUNCTION DEVICE EMPLOYING A GLASSY AMORPHOUS MATERIAL AS AN ACTIVE LAYER

Seymour Merrin, Fairfield, Conn., assignor to Innotech Corporation, Norwalk, Conn.

Division of Ser. No. 227,933, Feb. 22, 1972, Pat. No. 3,801,879, and a continuation-in-part of Ser. No. 122,420, March 9, 1971, abandoned. This application Nov. 13, 1973, Ser. No. 415,436

Int. Cl. H01l *15/00*

U.S. Cl. 357—17 **9 Claims**



1. A light emitting diode comprising a first active layer of semiconductor material having one type of electronic conductivity, and disposed upon said first layer and forming a rectifying junction therewith, a second semiconducting active layer of material having the other type of conductivity, said device characterized in that said second layer is a layer of noncrystalline glassy amorphous material having a thickness which is sufficiently thin to possess conductivity.

3,864,721

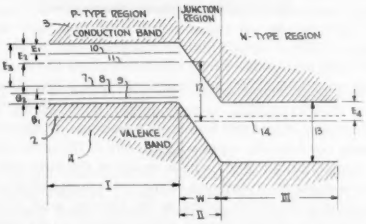
TUNNELING ELECTROLUMINESCENT DIODE WITH VOLTAGE VARIABLE WAVELENGTH OUTPUT

Marvin M. Cohen, Rochville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 18, 1973, Ser. No. 371,334

Int. Cl. H05b *33/00*

U.S. Cl. 357—17 **3 Claims**



1. A light emitting tunnel diode comprising

a semiconductive body having a first region of P-type conductivity and a second region of N-type conductivity which forms a junction with said first region wherein the impurity concentration in said N-type region is twice that in said P-type region and the width of said junction is several hundred angstrom units to facilitate tunneling, said first region having a plurality of different P-type impurities therein which create a plurality of different electron-devoid P-type impurity energy levels and a lesser number of N-type impurities therein which create a lesser number of electron-devoid N-type impurity levels,

said N-type region having a single N-type impurity therein which creates a single electron-filled N-type impurity energy level beneath said energy levels in said P-type region, said junction is forward biased to raise said single N-type energy level equal to the energy of any of said impurity levels in said P-type region whereby electrons tunnel cross said junction from said N-type to said P-type region.

3,864,722

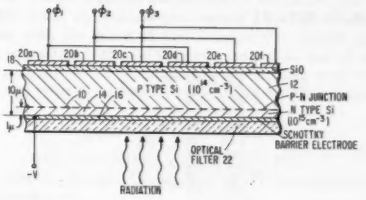
RADIATION SENSING ARRAYS

James Edward Carnes, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 2, 1973, Ser. No. 356,323

Int. Cl. H01l *11/00, 15/00*

U.S. Cl. 357—24 **9 Claims**



1. A radiation sensing array comprising, in combination:

a semiconductor substrate having a radiation receiving surface and an opposite surface and comprising a relatively thin semiconductor region of one conductivity type adjacent to said radiation receiving surface forming a junction with a relatively thicker semiconductor region of different conductivity type located between said junction and said opposite surface;

a relatively transparent, relatively thin metal film on said radiation receiving surface and forming a Schottky barrier therewith;

a plurality of electrode means at said opposite surface for creating surface potentials thereat for the accumulation, at a plurality of locations, of minority charge carriers; and means for reverse biasing said Schottky barrier at a level sufficient to deplete both semiconductor layers, whereby when radiation excitation is applied to said metal film, photoexcited majority charge carriers pass through said relatively thin semiconductor region and junction and appear as minority carriers in the relatively thicker semiconductor region, which may be collected as surface charge signals at said opposite surface.

3,864,723

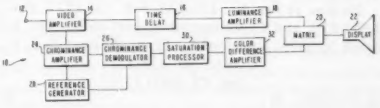
SYSTEM FOR PROCESSING CHROMINANCE SIGNALS

David H. Carpenter, Fairfield, Conn., assignor to Matsushita Electric Corporation of America, New York, N.Y.

Filed June 13, 1973, Ser. No. 369,526

Int. Cl. H04n *9/38*

U.S. Cl. 358—28 **13 Claims**



5. A color television receiver adapted to receive a composite video signal including a chrominance signal and a luminance signal for displaying a color image on a display device comprising means for providing a chrominance signal, means

for amplifying said chrominance signal including means for increasing the amplification of said chrominance signal for at least a portion of said chrominance signal having amplitudes above a first predetermined amplitude and means for decreasing the amplification of said chrominance signal for at least a portion of said chrominance signal having amplitudes above a second predetermined amplitude for controlling the saturation of the color image displayed on said display device.

3,864,724

TARGET STRUCTURE FOR SINGLE TUBE TYPE COLOR TELEVISION CAMERAS

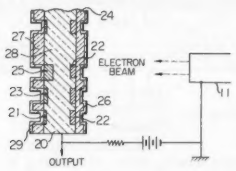
Shuji Kubo, and Yoshio Ando, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Oct. 10, 1973, Ser. No. 405,097

Claims priority, application Japan, Oct. 11, 1972, 47-102126; Sept. 25, 1973, 48-108171

Int. Cl. H01j *31/26*

U.S. Cl. 357—31 **8 Claims**



1. A target structure for a color television camera tube, comprising:

a semiconductive substrate of one conductivity type having first and second opposed surfaces for transmitting to said first surface an optical image incident on said second surface;

a first array of regions of the opposite conductivity type on said first surface; and

a second array of groups of first, second and third regions on said second surface in correspondence with said first array of regions, said first region being doped with an impurity of said one conductivity type at a first concentration to a first depth for generating carriers in response to the full visible spectrum range, said second region having a carrier concentration equal to that of said substrate for generating carriers in response to the medium to longer wavelength range of the spectrum, and said third region being doped with an impurity of said opposite conductivity type at a second concentration to a second depth for generating carriers in response to the longer wavelength range of the spectrum.

3,864,725

PHOTOCONDUCTIVE JUNCTION DEVICE EMPLOYING A GLASSY AMORPHOUS MATERIAL AS AN ACTIVE LAYER

Seymour Merrin, Fairfield, Conn., assignor to Innotech Corporation, Norwalk, Conn.

Division of Ser. No. 227,933, Feb. 22, 1972, Pat. No. 3,801,879, and a continuation-in-part of Ser. No. 122,420, March 9, 1971, abandoned. This application Nov. 13, 1973, Ser. No. 415,437

Int. Cl. H01l *15/00*

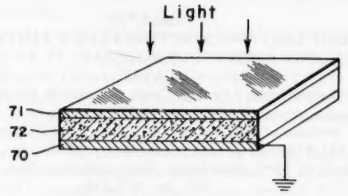
U.S. Cl. 357—31 **9 Claims**

1. An electrostatic image reproducing element comprising: a semiconductive substrate having one kind of electronic conductivity; and

disposed upon said semiconductive substrate and forming a rectifying junction therewith, a layer of non-crystalline glass having the other kind of electronic conductivity from that of said substrate, said layer being sufficiently thin to possess a useful level of conductivity and having a specific resistivity in excess of about 10^{12} ohm-cm.

8. The process for forming a latent electrostatic charge pattern on a surface which comprises the steps of:

providing an electrostatic image reproducing element comprising a semiconductor substrate having one kind of



electronic conductivity; disposed upon said semiconductor substrate and forming a rectifying junction therewith, a layer of non-crystalline glass having the other kind of electronic conductivity and a specific resistivity in excess of about 10^{12} ohm-cm; and conductive means for making electrical contact with said semiconductor substrate;

electrostatically charging the surface of said glass layer; and

exposing said surface to a pattern of activating electromagnetic radiation to form a latent electrostatic image.

3,864,726

CONTROLLABLE SEMICONDUCTOR RECTIFIER

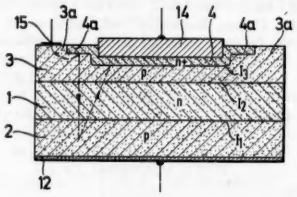
Horst Schafer, Zirndorf, Germany, assignor to Semikron Gesellschaft fur Gleichrichterbau und Elektronid G.m.b.H., Nurnberg, Germany

Filed July 30, 1973, Ser. No. 383,565

Claims priority, application Germany, July 28, 1972, 2237086

Int. Cl. H01l *11/00, 15/00*

U.S. Cl. 357—38 **5 Claims**



1. In a controllable semiconductor rectifier device including: a monocrystalline semiconductor body having planar major outer surfaces and four layer-type zones of alternatingly opposite conductivity types with the one of the inner zones of said semiconductor body which serves as the base zone, and which is adjacent to the one of the outer zones of said semiconductor body which serves as the emitter zone of the device, having a portion thereof which extends to the same one of said major outer surfaces of said semiconductor body as said emitter zone; a respective load current electrode ohmically contacting each of the two outer zones of said semiconductor body; and a control electrode ohmically contacting said portion of said base zone, the improvement wherein: said emitter zone has a first section with a substantial portion of its major outer surface being recessed from said one major outer surface of said semiconductor body, said first section extending to a first depth below said one major outer surface of said semiconductor body, and (b) a second section disposed at least at the edge of said first section of said emitter zone

adjacent said control electrode, said second section lying along said one major outer surface of said semiconductor body and extending to a second depth from said one major outer surface of said semiconductor body which is less than said first depth; said respective load current electrode contacting said emitter zone only contacts the recessed portion of said major outer surface of said first section of said emitter zone; and said second section of said emitter zone and said base zone form a pn-junction having a major portion lying in a plane substantially parallel to said one major outer surface of the semiconductor body.

3,864,727

SEMICONDUCTOR DEVICE

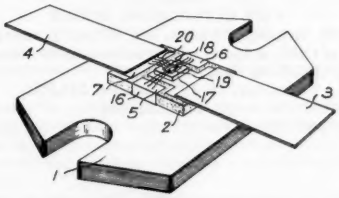
Werner Schoberl, Heilbronn, Germany, assignor to Licentia, Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Mar. 17, 1970, Ser. No. 20,203

Claims priority, application Germany, Mar. 21, 1969, 1914442

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 357—65 **12 Claims**



1. A semiconductor device suitable for power applications, comprising a four terminal transistor, a metallic base plate, an insulating intermediate plate mounted on said metallic base plate, four metallic regions provided on a surface of said intermediate plate opposite to a surface facing said metallic base plate, first and second of said metallic regions positioned opposite each other and at the margin of said intermediate plate, a third of said metallic regions extending between said first and second regions, and a fourth of said metallic regions positioned opposite said third metallic region and at the margin of said intermediate plate, said transistor being secured to said third metallic region by a collector region, means for connecting emitter electrodes of said transistor to associated said first and second metallic regions, metallic regions on said intermediate plate connecting said first and second metallic regions with said base plate, means for connecting a base electrode of said transistor to said fourth metallic region, a strip electrode lead electrically connected to said third metallic region, and a strip electrode lead electrically connected to said fourth metallic region.

3,864,728

SEMICONDUCTOR COMPONENTS HAVING BIMETALLIC LEAD CONNECTED THERETO

Hanns-Heinz Peltz; Hubert Pretsch, and Detlev Schmitter, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

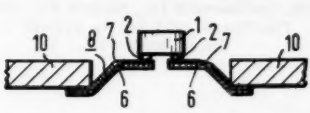
Continuation of Ser. No. 199,135, Nov. 16, 1971, abandoned. This application Aug. 27, 1973, Ser. No. 391,599

Claims priority, application Germany, Nov. 20, 1970, 2057126

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 357—71 **5 Claims**

1. In a system comprising a semiconductor body having a pair of contact pads projecting therefrom, a pair of carriers and a pair of electrically conductive connecting means, each connecting means electrically connecting a respective one of the contact pads to a respective one of the carriers, the improvement in which each of the connecting means is in the form of a bimetallic ribbon one face and 5 to 20 μ of the thickness of which is constituted of copper and the other face and 4 to 8 μ of the thickness of which is constituted of tin, the extremities of the contact pads and one of the faces of each of the carriers lie in respective spaced parallel planes, each of



the ribbons having one end portion a face of which is coincident with the plane of the extremities of the contact pads and which is in contact with the extremity of a respective one of the contact pads, an opposite end portion a face of which is coincident with the plane of said faces of the carriers and which is in contact with said face of a respective one of the carriers and an intermediate portion connecting said end portions and lying in a plane oblique to said parallel planes.

3,864,729

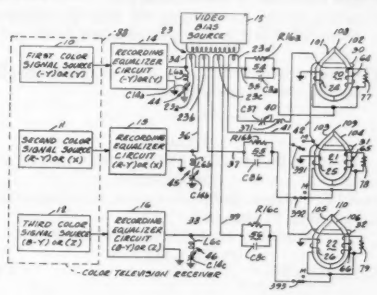
VIDEO TRANSDUCING APPARATUS

Marvin Camras, Glencoe, Ill., assignor to IIT Research Institute, Chicago, Ill.

Continuation of Ser. No. 182,211, Sept. 20, 1971, abandoned, which is a division of Ser. No. 34,504, May 4, 1970, Pat. No. 3,705,954, which is a division of Ser. No. 649,256, June 27, 1967, Pat. No. 3,596,008, which is a continuation-in-part of Ser. No. 528,934, Feb. 21, 1966, abandoned. This application Apr. 4, 1973, Ser. No. 347,689

Int. Cl. H04n *5/76, 9/02*

U.S. Cl. 358—4 **3 Claims**


VIDEO BIAS SOURCE
FIRST COLOR SIGNAL SOURCE (-Y)OR(Y)
SECOND COLOR SIGNAL SOURCE (R-Y)OR(X)
THIRD COLOR SIGNAL SOURCE (B-Y)OR(Z)
RECORDING EQUALIZER CIRCUIT (-Y)OR(Y)
RECORDING EQUALIZER CIRCUIT (R-Y)OR(X)
RECORDING EQUALIZER CIRCUIT (B-Y)OR(Z)
COLOR TELEVISION RECEIVER

1. A color television recording system comprising

receiver circuitry for supplying respective color television signals,

a video transducer head for coupling to a record medium to record the respective color television signals on the record medium, and

coupling means connected to said receiver circuitry and to said transducer head for transmitting the respective color television signals to said transducer head during recording.

said transducer head comprising at least two video head units scanning respective first and second channels of a record medium for recording respective color television signals containing information relative to a color image on said channels during a color image recording operation,

means for selectively rendering one of said head units inoperative during a monochrome signal recording operation and for supplying a monochrome signal containing luminance information to the other of said head units, and

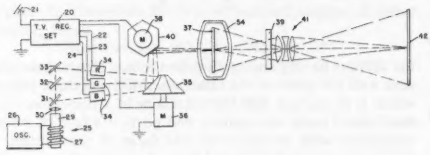
means for selectively recording a monochrome signal on each of said first and second channels during the monochrome signal recording operation.

3,864,730

TELEVISION RECEIVER INCLUDING A LARGE SCREEN PROJECTION SYSTEM

Solo S. Roth, One Sherwood Ter., Yonkers, N.Y. 10704

Filed Nov. 5, 1973, Ser. No. 412,694
Int. Cl. H04n *9/14*
U.S. Cl. 358—63 **9 Claims**



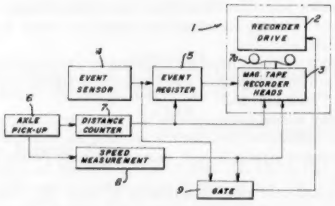
1. A large screen television receiver comprising:
a. a laser for generating a concentrated beam of light;
b. Optical means for dividing the beam into three equal spaced beams;
c. modulation means positioned in the path of each beam for modulating the beam energies in accordance with a three color television signal;
d. horizontal and vertical scanning means for forming a three color pattern of a television signal in a first image plane;
e. an intermediate screen positioned in the first image plane, said screen including a transparent supporting sheet, a plurality of strips of a metal which is rendered incandescent when struck by a laser beam, and a plurality of color filters positioned adjacent to the strips for filtering the light produced by the metal strips;
f. optical means for focusing the light generated by the intermediate screen and projecting it to a second image plane; and
g. a viewing screen positioned in the second image plane for showing the television signal.

3,864,731

VEHICLE DATA RECORDER EMPLOYING DATA COMPRESSION

Bernard E. Callahan, Hoffmann Estates, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed July 16, 1973, Ser. No. 379,371
Int. Cl. G11b *5/00*
U.S. Cl. 360—5 **9 Claims**



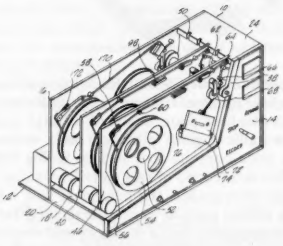
1. A vehicle data recorder comprising:
means connected to at least one wheel that is connected to the vehicle for generating signals corresponding to distance travelled by the vehicle;
means connected to the signal generating means for counting the signals;
means connected to the counter for periodically detecting a preselected count corresponding to a particular distance travelled by the vehicle;
clock means connected to the output of the detecting means for producing the clock pulse of predetermined width upon detection of the preselected count;
comparator means enabled by the clock means for an interval sufficient to receive data from the counting means, corresponding to the present vehicle speed;
storing means for storing speed data from a previous clock cycle;
means connecting storing means to the comparator means for determining whether a change in speed occurred;
means connecting the output of the storing means to means for recording speed data when a print function exists;
second counting means connected to the clock means for counting accumulated clock pulses corresponding to accumulated distance travelled; and
means connecting the output of the second counting means to the recording means for recording accumulated distance travelled by the vehicle when a print function exists.

3,864,732

TAPE DUPLICATING DEVICE

Robert M. Grindley, Glendale, and Michael J. Strong, Simi, both of Calif., assignors to International Audio-Visual Hong Kong Ltd., Hong Kong, Hong Kong

Filed Apr. 19, 1972, Ser. No. 245,572
Int. Cl. G11b *5/86*
U.S. Cl. 360—15 **22 Claims**



1. A tape duplicating device comprising a frame; a back mounting plate positioned on said frame; means for mounting a master magnetic tape on said back mounting plate; at least one mounting panel removably positioned on said frame, each of at least said one mounting panel including means for mounting a receiving magnetic tape, having a copy supply spindle rotatably mounted to said mounting panel, a copy take-up spindle rotatably mounted to said mounting panel, and guide means for defining the path of the receiving magnetic tape between said copy supply spindle and said copy take-up spindle; at least one magnetic tape recording head positioned on said frame to intercept the path of the receiving magnetic tape defined by said guide means on at least said one mounting panel; a capstan mounted on said frame; means for clamping the receiving magnetic tape on at least said one mounting panel against said capstan, said means being pivotally mounted on at least said one mounting panel; electronic means for transmitting information from a master magnetic tape onto receiving magnetic tapes; means to drive said mounting means for mounting a master magnetic tape and said capstan; and means mounted on at least said one mounting panel for driving said copy take-up spindle using said capstan; at least said one mounting panel, said means for mounting a receiving magnetic tape, said means for clamping the receiving magnetic tape against said capstan and said means for driving said copy take-up spindle being in operable association with said capstan and at least said one magnetic

tape recording head such that said mounting panel may be positioned on and removed from said frame without rethreading of the receiving magnetic tape.

3,864,733

CONTROL SIGNAL APPARATUS FOR VIDEO DISC PLAYER

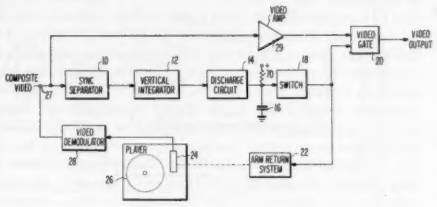
Charles D. Boltz, Jr., Greenwood, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 19, 1973, Ser. No. 342,374

Claims priority, application Great Britain, Apr. 19, 1972, 18041/72

Int. Cl. H04n *5/78*

U.S. Cl. 360—33 **15 Claims**



1. A control system for an image reproducing system comprising:

apparatus for providing electrical signals representative of informtion stored in a spiral pattern on a storage medium, said signals including varying image-representative components and regularly recurring synchronizing components;

means for separating said image-representative and regularly recurring synchronizing components;

detecting means responsive to said regularly recurring synchronizing components for providing a first control signal in response to the presence of said synchronizing components and a second control signal in response to the absence of said synchronizing components for a predetermined length of time, said predetermined length of time being greater than the time required to provide a first control signal upon the appearance of said synchronizing components; and

control means coupled to said detecting means for inhibiting operation of said electrical signal providing apparatus in response to said second control signal and permitting operation of said electrical signal providing apparatus in response to said first control signal.

3,864,734

PULSE-CODE MODULATION DETECTOR AND EQUALIZER

David B. Gish, Pasadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 5, 1973, Ser. No. 321,198

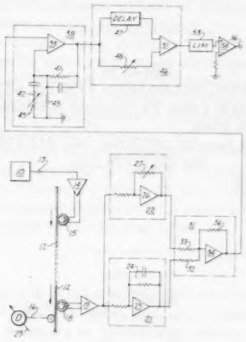
Int. Cl. G11b *5/09*

U.S. Cl. 360—41 **7 Claims**

1. In apparatus for recovering pulse-code modulated digital data from a readback signal, the improvement comprising in combination:

means for partially equalizing said readback signal comprising low-frequency equalizing means, mid-frequency equalizing means, and partial high-frequency equalizing means including only RC filter means as passive filter means; and

means connected to said partial equalizing means for completing said partial equalization of said readback signal and for detecting said data, including means for delaying said partially equalized readback signal, means for providing a relatively undelayed version of said readback signal, and means for providing a digital signal corresponding to the difference between said delayed readback signal and said relatively undelayed version of said readback signal, said delay means including further filter



means including only RC filters as passive filter means for completing said partial equalization with the aid of said means for providing said undelayed version and said means for providing said difference signal.

3,864,735

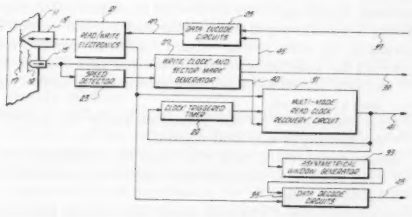
READ/WRITE SYSTEM FOR HIGH DENSITY MAGNETIC RECORDING

Martin F. Davis, Thousand Oaks; Francis J. Schwanauer, Agoura; Ivan E. Walenta, Westlake Village, and Gary J. Walker, Thousand Oaks, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sept. 12, 1973, Ser. No. 396,479

Int. Cl. G11b *5/09*

U.S. Cl. 360—51 **5 Claims**



1. In a system for reading and writing self-clocking binary encoded data on a moving storage medium having data writing and reading apparatus and apparatus for generating a signal indicating the speed of said storage medium, binary data encoding and decoding apparatus, comprising:

means responsive to the speed indicating signal for generating write clock signals;

means utilizing the write clock signals for encoding input binary data, encoded according to a non-self-clocking encoding scheme, into a self-clocking binary data pattern for writing on the storage medium;

means responsive to the storage medium speed indicating signal and the self-clocking binary data pattern read from the storage medium for generating read clock signals;

means responsive to the read clock signals for generating asymmetrical data windows; and,

means utilizing the asymmetrical data windows for decoding the self-clocking binary data pattern read from the medium into a binary data pattern representative of the non-self-clocking input binary data.

3,864,736

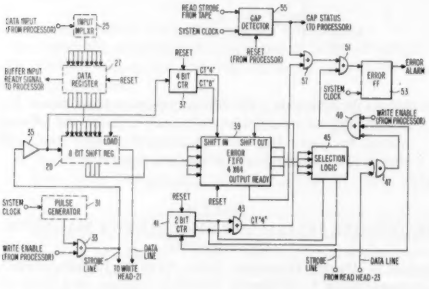
MAGNETIC RECORDING VERIFICATION

Michael J. Hazzard, Exton, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 25, 1973, Ser. No. 373,270

Int. Cl. G11b 5/09

U.S. Cl. 360—53 8 Claims



1. Apparatus, receiving and sending signals to a digital processor, for bit-by-bit verification, immediately upon recording, of digital data serially recorded onto a magnetic medium, including a dual write-read head and a shift register having a parallel input and output and a serial output connected to the write portion of said dual head, comprising:

means for generating strobe pulses and then feeding same to said recording head, said means being connected to said write head;

means responsive to said generated strobe for controlling the shifting of said shift register;

means connected to said read head for comparing data as read from said medium with characters recorded on a bit-by-bit basis;

means associated with said comparison means for generating an alarm when respective bits do not compare;

a first-in, first-out matrix register having parallel input and output, shift-in and shift-out controls and output ready terminal, said inputs of said matrix register being connected to a portion of the parallel output of said shift register;

a first counter means connected to said strobe generating means, for providing a first signal output and a second signal output, said first signal output being connected to said shift-in terminal of said matrix register, said second signal output being connected to said load control of said shift register;

a second counter connected to the strobe pulse read head winding; and

a first and-gate with inputs connected to the output of said second counter.

3,864,737

DATA RECORDERS

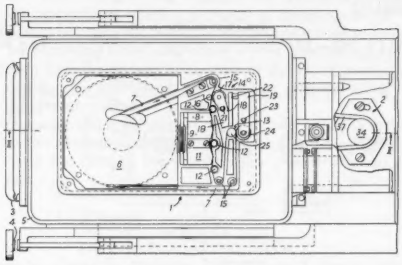
David James Maxwell, Bracknell, and Frank Richard Towner, Wokingham, both of England, assignors to Sperry Rand Limited, London, England

Filed Aug. 29, 1973, Ser. No. 392,707

Claims priority, application Great Britain, Sept. 6, 1972, 41232/72

Int. Cl. G11b 15/12

U.S. Cl. 360—63 7 Claims



1. A data recorder comprising a movable magnetic recording medium in the form of a base material with a coating of magnetic material thereon, the magnetic material being removed from the base material at a plurality of areas spaced in the direction of movement of the recording medium, said areas forming a predetermined pattern at a predetermined position on said medium, and sensing means including magnetic head means operable to sense the presence of said areas in accordance with said pattern passing said magnetic head means and to produce a signal indicative thereof, thereby detecting said predetermined position on said medium.

3,864,738

TAPE RECORDING AND REPRODUCING APPARATUS WITH A MECHANISM FOR CHANGING OVER THE ELECTRICAL CHARACTERISTICS OF THE APPARATUS

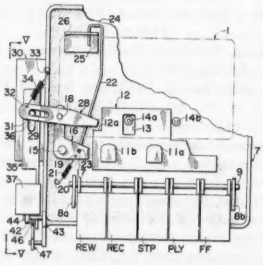
Keisuke Syohji, Nagoya-shi, Aichi-ken, Japan, assignor to Shin-Shirasuna Electric Corporation, Aichi-Ken, Japan

[illegible]ed May 15, 1973, Ser. No. 360,575

Claims priority, application Japan, Aug. 31, 1972, 47-101973[U]

Int. Cl. G11b 15/02, 5/47

U.S. Cl. 360—69 2 Claims



1. A cassette-type magnetic tape recording and reproducing apparatus employing a tape cassette containing a pair of reels and a magnetic tape of a predetermined length transported therebetween, said magnetic tape being formed either by a first type of magnetic material having first characteristics or a

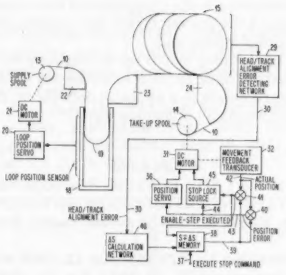
second type of magnetic material having second characteristics, said tape cassette being provided at the back wall thereof with means indicating the type of the magnetic tape contained therein, a depressable-key board including at least a playback key, magnetic head means, a carrier means having said magnetic head means mounted thereon and being forwardly movable by depressing said playback key so that said magnetic head means is brought into engagement with said magnetic tape, and a mechanism including switch means for changing over the electrical characteristics of said magnetic tape recording and reproducing apparatus so as to match the type of the magnetic material forming said magnetic tape, characterized in that said change-over mechanism comprises detector means contacting said indication means of said tape cassette and assuming a first or position according to the type of the magnetic material forming said magnetic tape contained in said tape cassette, shifter means mechanically coupled to said detector means, and actuator means pivotally mounted on said shifter means for actuating said switch means, said shifter means assuming in accordance with the position of said detector means either a first position where said actuator means is engaged by said carrier means when the latter is forwardly moved in response to the depression of said playback key or a second position where said actuator means is not engaged by said carrier means when the latter is caused to effect said movement, wherein when said detector means assumes said first position and said playback key is depressed, said actuator means is engaged by said carrier means and is pivotally moved to actuate said switch means, thereby changing over the electrical characteristics of said apparatus.

3,864,739

TAPE MOTION CONTROL IN AN INCREMENTING MAGNETIC TAPE TRANSPORT

Howard C. Jackson, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 24, 1973, Ser. No. 391,405
Int. Cl. G11n *15/18, 5/52*
U.S. Cl. 360—71 **15 Claims**



4. In combination:

a tape take-up spool and a motor connected to rotate the same,

a tape supply,

a tape buffer buffering a quantity of magnetic tape as the tape extends from said supply to said takeup spool,

a movement transducer connected to be driven by said take-up motor, and providing an output indicative of the rotational distance moved by said tape take-up spool

a magnetic transducer cooperating with the length of tape extending between said tape buffer and said take-up spool, and transducing the tape while said tape is relatively stationary,

said tape having a plurality of spaced data fields and having servo indicia for at least certain of said data fields,

means generating a tape step command,

a position servo controlled by said step command and the output of said movement transduucer, and operable to energize said take-up motor to execute step rotation of said tape take-up spool, said rotation resulting in a change in the tape radius at said tape take-up spool so that the tape moves a distance at least as great as one data field in response to said step command,

said servo indicia being operable to identify desired stop positions for said tape adjacent said magnetic transducer, means operable to read said servo indicia when a step has been executed and to originate an alignment error signal representing misalignment of said desired stop positions and said magnetic transducer, and

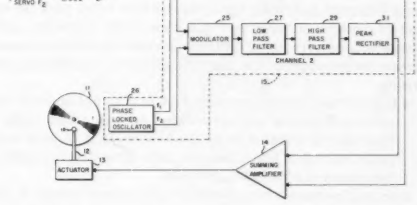
step modification means controlled by said alignment error signal and operable to modify a subsequent step command in accordance therewith, said modification resulting in a reduced alignment error signal after a subsequent step rotation of said take-up spool.

3,864,740

TRACK FOLLOWING SERVO SYSTEM

Frank J. Sordello, Los Gatos, and John Cuda, San Jose, both of Calif., assignors to Information Storage Systems, Inc., Cupertino, Calif.

Filed Nov. 5, 1973, Ser. No. 412,675
Int. Cl. G11b *21/10, 5/02*
U.S. Cl. 360—77 **5 Claims**



1. A servo system for positioning a transducer relative to a storage medium to read information stored on the medium, said system comprising:

positioning means energizeable for moving the transducer laterally to preselected recording positions relative to the storage medium,

means to effect relative movement between the storage medium and the transducer thereby to enable the transfer of information between the medium and transducer,

a plurality of side-by-side closely-spaced first and second servo waveforms recorded on the medium such that a pair of first and second servo waveforms identifies a preselected position on the medium and wherein the first and second waveforms are at different but similar cyclic frequencies whereby movement of the transducer to a position near said preselected position will enable the transducer to generate a position signal resulting from reading both servo waveform signals with the magnitude of such position signal being indicative of the lateral position of the transducer relative to that servo waveform,

first and second channels receiving the position signal from the transducer and each including modulators capable of mixing cyclic signals,

means to supply to the first and second channel modulators, first and second modulating signals respectively having frequencies similar to the frequencies of the first and second servo waveforms respectively to generate a difference signal resulting by the subtraction of the position

signal and the modulating signal in each channel with each difference signal having a magnitude indicative to the relative position of the transducer to one servo waveform,

means to detect the difference signal in each channel,

and means to energize the positioning means responsive to the magnitudes of the difference signals thereby to move the transducer towards the preselected position between the servo waveforms.

3,864,741

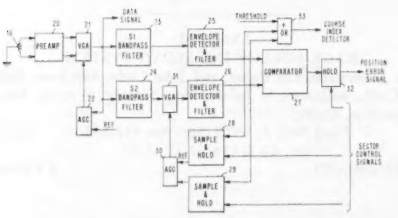
SERVO CHANNEL EQUALIZATION NETWORK

Theodore A. Schwarz, Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1973, Ser. No. 374,294

Int. Cl. G11b *21/10*

U.S. Cl. 360—77 **5 Claims**



1. In a system for following a target path, said system deriving a first path following signal from a first servo path on one side of said target path and a second path following signal from a second servo path on the other side of said target path, means for generating 100 percent off-track conditions comprising

a first portion which contains said first signal on both said servo paths, said portion located on said servo paths so that said first signal is derived from each of said servo paths during a first common time period to generate a 100 percent off-track condition,

a second portion which contains said second signal on said servo paths, said second portion located on said servo paths so that said second signal is derived from each of said servo paths during a second common time period to generate a second and different 100 percent off-track condition.

3,864,742

AUTOMATIC TAPE LOADING MECHANISM FOR A RECORDING AND/OR REPRODUCING APPARATUS

Hiroshi Katoh, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama City, Kanagawa-ken, Japan

Filed June 20, 1973, Ser. No. 371,837

Claims priority, application Japan, June 24, 1972, 47-63578; June 24, 1972, 47-63579; June 24, 1972, 47-63580; July 20, 1972, 47-72753; July 26, 1972, 47-74087; June 24, 1972, 47-74981[U]; June 24, 1972, 47-74982[U]

Int. Cl. G11b *15/66, 5/52*

U.S. Cl. 360—85 **9 Claims**

1. An automatic tape loading mechanism for a recording and/or reproducing apparatus comprising:

a. a cylindrical tape guide means having at least one rotating head associated therewith;

b. a ring-shaped means rotatably supported to encircle said tape guide means;

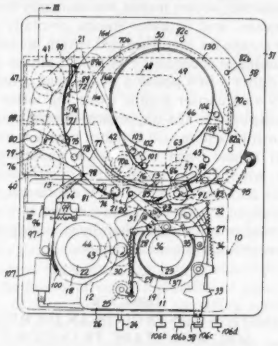
c. means for rotating a shaft in one direction,

d. roller means for driving said ring-shaped means;

e. ,first transmitting means for pressing said roller means against a rim of said ring-shaped means and transmitting the torque of said rotating shaft to said roller means to turn said ring-shaped means in a specific direction during a loading mode;

f. tape drawing out and guiding means separate from said ring-shaped means for drawing a tape out of a housing structure by engaging with said ring-shaped means and moving interrelatedly with the turning of said ring-shaped means during the loading mode;

g. means for locking the engagement of said tape drawing out and guiding means with said ring-shaped means while said ring-shaped means turns through a predetermined angle, said locking means disengaging said tape drawing out and guiding means from said ring-shaped means at a position which said ring-shaped means reaches after turning through the predetermined angle and locking said tape drawing out and guiding means at a position which is disengaged from said ring-shaped means;



h. tape pulling around and guiding means mounted on said ring-shaped structure and moving together therewith for intercepting the tape drawn out by said tape drawing out and guiding means and for pulling the tape to wrap it around the peripheral surface of said cylindrical tape guide means, with the wrap engaging the cylindrical tape guide over a specific angularly extent thereof;

i. means responsive to the completion of the wrapping of the tape around the guiding means for stopping the rotation of said roller means; and

j. second transmitting means for transmitting the torque of said rotating shaft to said roller means to rotate said ring-shaped means in a direction opposite to the specific direction during an unloading mode.

3,864,743

ARRANGEMENT FOR PLAYING RECORDING ON AN ENDLESS TAPE IN CARTRIDGES OF DIFFERENT TYPES

Marcel Jules Helene Staar, 479 avenue Louise, Brussels, Belgium

Continuation of Ser. No. 823,883, May 12, 1969, abandoned. This application Mar. 13, 1972, Ser. No. 234,250

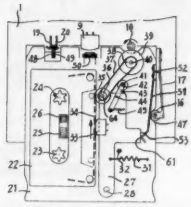
Claims priority, application Belgium, May 29, 1968, 715838

Int. Cl. G11b *23/04*

U.S. Cl. 360—94 **13 Claims**

1. In a box-type tape record player for playing an endless-magnetic tape cartridge, an aperture in said player adapted to slidingly receive said cartridge, said player comprising tape driving means and playback means including a first playback head for the magnetic tape contained in said cartridge; an improvement comprising said aperture in said player being adapted to slidingly receive upon withdrawal of said cartridge, a converter having exterior geometrical dimensions and operative characteristics substantially corresponding to those of said endless-magnetic tape cartridge; said converter including an aperture dimensioned to receive and position a magnetic-tape-containing cartridge of generally smaller exterior dimen-

sions than said first-mentioned cartridge; a second playback head in said converter for reading the magnetic tape of the smaller-dimensioned cartridge positioned therein; means in said converter for driving said last-mentioned magnetic tape, said tape driving means being connectable with the driving means of the player, said smaller dimensioned cartridge including a pair of rotatable spools, a magnetic tape containing said recordings being wound about said spools and extending therebetween, said tape being adapted to be wound and unwound respectively, from one spool to the other, said playback means comprising a capstan in said player rotatably driven by a motor positioned in said player along said aperture edge, drive roller means in said converter for imparting rotation to said spools, a longitudinally inextensible flexible belt in



said converter drivingly interconnecting said roller means and said capstan for moving said tape along said second playback head, a pivotable lever on said converter, said lever having a rectilinear edge which in the operative position of said converter extends in proximity to said further cartridge, said second playback head and said drive roller means being mounted on said lever; and spring means urging said lever out of contact with the tape, said lever including a projection, a slope on said projection, said projection being adapted to make contact with the internal surface of the aperture formed in the player so as to cause said lever to pivot and the second head and roller means contact with the tape in said smaller-dimensioned cartridge upon insertion of the converter in said player.

3,864,744

APPARATUS FOR DETECTING THE LOADING OF A CASSETTE ON A CASSETTE TAPE DECK

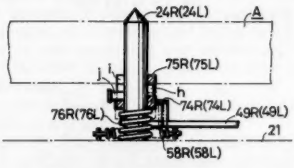
Yasuhiro Uemura, Tokyo, Japan, assignor to Teac Corporation, Tokyo, Japan

Filed June 19, 1972, Ser. No. 263,969

Claims priority, application Japan, June 20, 1971, 46-44082; June 20, 1971, 46-44083; June 20, 1971, 46-44084

Int. Cl. G11b *15/02, 15/18;* **B65h** *17/20*

U.S. Cl. 360—96 **2 Claims**



1. Apparatus for detecting the loading of a cassette on a cassette tape deck; said cassette having a magnetic tape wound on reels having central apertures respectively in a casing; said casing having a first major face having formed therein at least capstan receiving apertures, reel drive shaft receiving apertures and guide pin receiving holes and a second major face having formed therein at least a magnetic head receiving window and pinch roller receiving windows and being substantially perpendicular to said first major face; said deck having a capstan, a pinch roller making rotary contact with said capstan, a magnetic head, a reel drive shaft and a guide pin, said capstan, said reel drive shaft and said guide pin being so positioned as to be inserted into said capstan receiving apertures, said reel drive shaft receiving aperture and said guide pin receiving hole of said cassette respectively only when said cassette is loaded on said deck; and said magnetic head being movable between operative and inoperative positions and being inserted into said magnetic head receiving window at its operative position only when said cassette is loaded on said deck; a sliding member slidably mounted on said guide pin, said sliding member being biased by a first spring means toward the upper end of said guide pin and having a groove formed therein to extend perpendicular to a direction of sliding of said sliding member, and a member movably mounted on said deck and biased by a second spring means toward said guide pin and having an engaging member engageable with said groove of said sliding member, whereby operative loading of said cassette on said deck is detected based upon sliding of said sliding member against said first spring means and engagement of said engaging member with said groove of said sliding member.

3,864,745

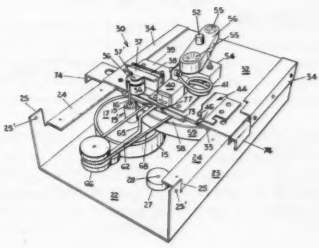
MANUAL SOUND REPRODUCTION APPARATUS

Stephen A. Platt, Grand Haven, Mich., assignor to Stephen A. Platt and Vernet B. Platt, both of Grand Haven, Mich.

Filed Sept. 21, 1972, Ser. No. 290,877

Int. Cl. G11b *5/54, 15/40*

U.S. Cl. 360—96 **22 Claims**



1. In a manually operated mechanism for reproducing information recorded on a tape comprising:

tape carrier means including a pair of drive spindles;

a base assembly including a carriage movably positioned on said base assembly;

a tape playback head positioned on said carriage for movement between tape engaging and non-engaging positions; and

manually operated drive means positioned on said carriage and selectively engageable with one of said drive spindles for alternatively rotating one of said spindles to transport said tape across said playback head in first or second directions.

3,864,746

END OF MESSAGE UNIT FOR USE IN PUSH TO TALK MICROPHONES

Edward S. Burgess, 101 Morse Ave, Rutherford, N.J. 07070

Filed Aug. 13, 1973, Ser. No. 388,079

Int. Cl. G11b *15/18, 15/40, 27/00*

U.S. Cl. 360—97 **12 Claims**

8. A signal producing device including:

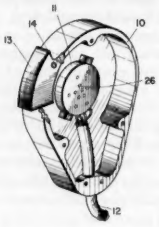
a housing;

a disc of magnetic material;

means for mounting said disc of magnetic material for rotation in response to a force applied in a first manner and

to vibrate in response to sound waves impinging thereon; and

a magnetic pick-up device mounted on said housing adjacent to said disc to provide a signal representation of



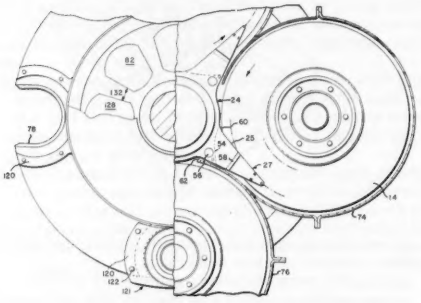
magnetic information stored on said disc in response to rotation thereof and to the vibrations of said disc in response to sound wave impingement thereon thereby serving the dual function of both a magnetic recorder and a microphone.

3,864,747

MULTIPLE PACK MAGNETIC DISK SYSTEM

Ivan Pejcha, San Jose, Calif., assignor to Storage Disk Corporation, Louisville, Colo.

Filed May 29, 1973, Ser. No. 364,950
Int. Cl. G11b *17/00*
U.S. Cl. 360—98 **25 Claims**



1. A magnetic disk subsystem comprising:

a plurality of packs of magnetic disks,

a plurality of pack spindles, each pack of disks being mounted in nonremovable fashion on a spindle,

a baseplate, the pack spindles being mounted on said baseplate with their axes parallel to one another and with the edges of disks of adjoining pack spindles in close proximity one to the other,

one single rotary access mechanism including:

a plurality of magnetic heads,

a plurality of arrays of arms mounted for common rotation, one array for each of said disk packs, each array including arms carrying said magnetic heads into read/write relationship with the tracks of one pack of magnetic disks,

a stationary shaft affixed to said baseplate to be parallel to and in the middle of said spindles, and

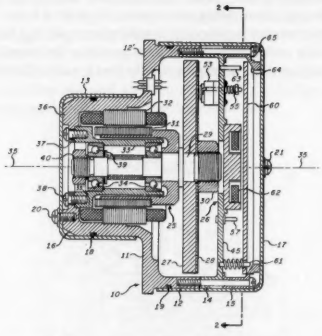
a positioning rotor mounted for rotation on said shaft, said positioning rotor having a large diameter such that the periphery of said positioning rotor is in close proximity to the edges of said disks whereby the length of said arms is minimized.

3,864,748

MAGNETIC DISK MEMORY

Craig T. Herdman, and Peter E. Jacobson, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, Great Neck, N.Y.

Filed July 23, 1973, Ser. No. 381,817
Int. Cl. G11b *5/60*
U.S. Cl. 360—102 **10 Claims**



1. A magnetic disk memory apparatus comprising

a closed housing containing a gas atmosphere,

a disk member having a magnetizable surface and motive means supported within said housing for spinning said disk at high speed about its axis of symmetry,

at least one read/write head assembly including at least one core and coil element carried by an integral support member, a portion of said core element only extending from a surface of said support member normally adjacent said disk surface,

said head assembly further comprising flexure means coupled between said housing and said core support member including means for forcing said support member toward said disk surface, and

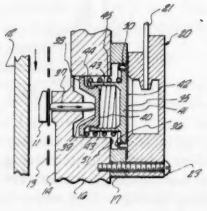
said extending core portion including a gas pressure generating configuration on its leading edge relative to disk velocity for generating a gas pressure opposing said flexure force to thereby provide a gas bearing support for said core and support member.

3,864,749

ACTUATED SPRING MECHANISM FOR POSITIONING MAGNETIC HEADS

Alpheus F. Stansell, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 12, 1973, Ser. No. 396,478
Int. Cl. G11b *5/60*
U.S. Cl. 360—103 **9 Claims**



1. An actuating device for moving a magnetic head toward or away from a magnetic medium comprising in combination:

a. spring means having first and second ends, both said first

and second ends being movable toward or away from said magnetic medium;

b. a first movable member adjacent the first end of said spring means, said first movable member being adapted for coupling the first end of said spring means to said movable head;

c. a second movable member adjacent the second end of said spring means, said second movable member being adapted for moving the second end of said spring means between first and second positions, the second position of the second end of said spring means being closer to said magnetic medium than the first position of the second end of said spring means;

d. means mechanically intercoupled between said first and second movable members for maintaining said spring means in compression and setting the maximum spacing between the first and second ends of said spring means; and

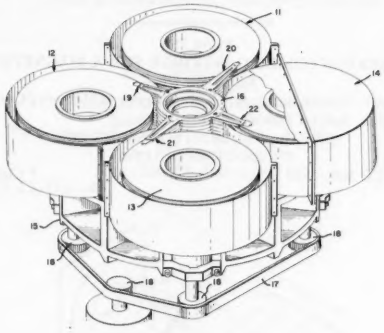
e. controllable means coupled to said second movable member for moving said second movable member between said first and second positions, said second position being chosen so that the force urging said head towards said medium at said second position is substantially independent of said controllable means.

3,864,750

CANTILEVERED ROTARY ACCESS MECHANISM ARMS FOR MAGNETIC DISK SYSTEM

Roy Applequist, Redwood City, Calif., assignor to Storage Disk Corporation, Louisville, Colo.

Filed Oct. 19, 1973, Ser. No. 407,886
Int. Cl. G11b *5/54*
U.S. Cl. 360—105 **1 Claim**



1. In a magnetic disk subsystem of the type including:

a plurality of packs of magnetic disks, each pack of disks being mounted on a spindle, said packs being disposed with the spindles parallel to one another and with the edges of the disks in adjoining packs in close proximity one to the other,

a rotary access mechanism shaft mounted parallel to, and in the middle of said spindles, and

magnetic heads carried into read/write relationship with the tracks of each pack of magnetic disks, the improvement comprising:

a plurality of positioning rotors, each having a central circular opening through which said access mechanism shaft extends, said positioning rotors being stacked on said shaft,

a plurality of rigid arms integrally formed with each positioning rotor, said arms extending between adjacent disks of each pack and terminating in a pair of opposing flexible members, each flexible member having disposed thereon a magnetic head; and

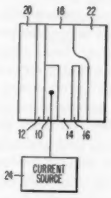
a plurality of coil springs, one of said coil springs being disposed between the flexible members of each arm in a compressed state for urging the heads apart to provide the sole loading of the heads on the surfaces of said disks.

3,864,751

INDUCED BIAS MAGNETORESISTIVE READ TRANSDUCER

Thomas Joseph Beaulieu, San Jose, and Daniel Andrew Nepela, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 4, 1973, Ser. No. 403,702
Int. Cl. G11b *5/30*
U.S. Cl. 360—113 **11 Claims**



1. A magnetoresistive read transducer assembly comprising:

a magnetoresistive conductive layer formed of magnetic material;

a soft highly permeable magnetic bias film disposed substantially parallel to said layer and spaced from said layer but magnetostatically coupled thereto, said layer and film having a prescribed ratio of thicknesses;

insulating material disposed between said layer and said bias film;

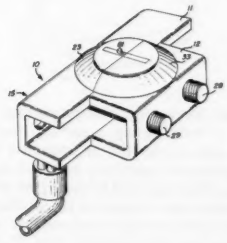
means coupled to said layer for applying a drive current to said layer, so that said bias film is magnetically saturated and produces a back magnetic field that is applied as a linear biasing field to said magnetoresistive element, the magnitude of said biasing field being a function of the magnitude of said drive current.

3,864,752

MAGNETIC HEAD ASSEMBLY HAVING A SLOTTED BODY PORTION OF ELASTIC MATERIAL FOR CLAMPING A TRANSDUCER AND METHOD OF MANUFACTURE THEREFOR

Herbert E. Thompson, Los Gatos, Calif., assignor to Shugart Associates, Inc., Sunnyvale, Calif.

Filed Dec. 10, 1973, Ser. No. 423,170
Int. Cl. G11b *5/16, 5/26*
U.S. Cl. 360—121 **19 Claims**



1. A magnetic haead assembly comprising:

a magnetic transducer assembly including a first magnetic core and a second magnetic core, each core having a certain width;

a first body member comprised of an elastic material including a first mating surface having a first slot therein, opposed surfaces of said first slot defining first core-gripping surfaces that are normally spaced-apart less than said certain width, said first core being disposed within said first slot when external forces are applied to said first body member to elastically open said first slot to a width more than said certain width, said first slot thereafter being permitted to elastically close so that said first core-gripping surfaces clampingly engage said first core;

a second body member comprised of an elastic material including a second mating surface having a second slot therein, opposed surfaces of said second slot defining second core-gripping surfaces that are normally spaced-apart less than said certain width, said second core being disposed within said second slot when external forces are applied to said second body member to elastically open said second slot to a width more than said certain width, said second slot thereafter being permitted to elastically close so that said second core-gripping surfaces clampingly engage said second core; and

means for securing said first and said second body members together with said first and second mating surfaces in abutting relationship and with said first and second cores aligned to define a magnetic transducing gap.

3,864,753

TRANSDUCER HEAD WITH SPACER MATERIAL MADE OF STAINLESS STEEL

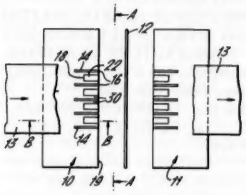
Robert Sidney Becker, Pyrford; Eric Frank Painter, Shepperton, and Gerrard Charles Rickard, Woodham, all of England, assignors to Gresham Inforag Ltd., Weybridge, England

Filed May 9, 1973, Ser. No. 358,698

Claims priority, application Great Britain, May 9, 1972, 21638/72

Int. Cl. G11b *5/12, 5/22, 5/26*

U.S. Cl. 360—121 **10 Claims**



1. A multi-track tape electromagnetic transducer head comprising a body having a surface over which a tape is adapted to pass, a plurality of respective magnetic tracking circuits supported in said body and each having a pole piece having a face flush with and forming part of said surface, each said face contacting a respective longitudinally extending area of said tape for the transfer of information between the associated magnetic and the associated area of the tape, characterised in that said surface is at least partially of stainless steel between said magnetic tracking circuits.

3,864,754

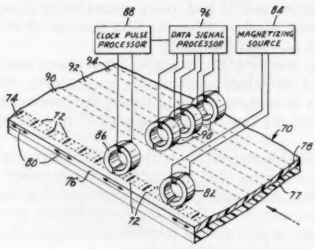
MAGNETIC RECORD MEDIUM HAVING PERMANENT RECORD PATTERN AND INFORMATION PROCESSING SYSTEM USING SAID MEDIUM

Richard L. Miklos, Maplewood, and Jack E. Blackburn, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St Paul, Mich.

Filed May 2, 1973, Ser. No. 356,605

Int. Cl. G11b *5/74*

U.S. Cl. 360—131 **13 Claims**



1. In a magnetic recording medium comprising a backing and a layer thereon having a smooth outer surface, which layer comprises uniformly dispersed magnetizable material having magnetic anisotropy which magnetizable material is predominantly physically aligned parallel to an intended direction of movement, wherein the improvement comprises the magnetizable material at a plurality of selected locations spaced along a track extending in said intended direction of movement of the medium being physicaly aligned in a direction transverse thereto to provide a series of spaced magnetically detectable permanent position/clocking marks.

3,864,755

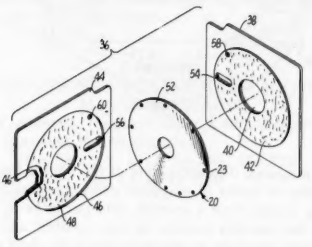
THERMOFORMED CARTRIDGE FOR A MAGNETIC RECORD DISC

James V. Hargis, Saratoga, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Aug. 20, 1973, Ser. No. 389,993

Int. Cl. G11b *5/16*

U.S. Cl. 360—133 **7 Claims**

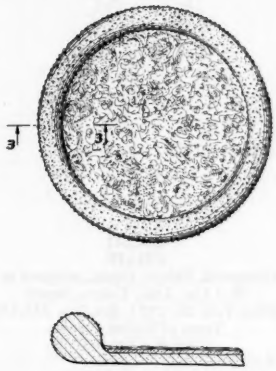


1. A cartridge for containing a flexible, rotary, magnetic record memory disc comprising a substantially rigid first cover having an interior flat surface and a second cover which is substantially thinner than the first cover and which is deformed to provide a recess coextensive with the circumferential edge of the memory disc, the second cover having an interior surface which is bonded to the flat interior surface of the first cover along a path immediately adjacent to and exterior of the recess in the second cover to provide a circumferentially sealed cavity for housing the memory disc, the junction of the interior surface of the first and second covers lying entirely in a plane which is parallel to and spaced from the memory disc's plane of rotation.

DESIGNS

GRANTED FEBRUARY 4, 1975

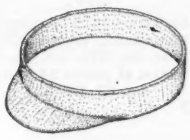
234,233
PIZZA
Charles Silvestri, 280 85th St., Brooklyn, N.Y. 11209
Filed Oct. 31, 1972, Ser. No. 302,568
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—11



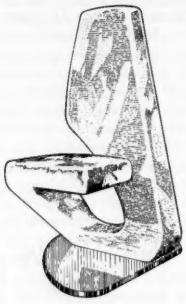
234,234
SWEATSHIRT
Phillip L. Nally, 302 W. Muir Ave., Bardstown, Ky. 40004
Filed Feb. 5, 1973, Ser. No. 329,813
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—44

234,235
SWEATSHIRT
Phillip L. Nally, 302 W. Muir Ave., Bardstown, Ky. 40004
Filed Feb. 5, 1973, Ser. No. 329,839
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—44

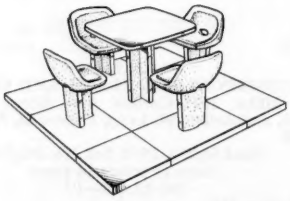
234,236
COMBINED SWEATBAND AND VISOR
Jon B. Miller, 2625 Garfield Ave., Silver Spring, Md. 20910, and Arthur W. Lynn, Drawer D, Marietta, Ga. 30060
Filed Sept. 4, 1973, Ser. No. 393,730
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—247



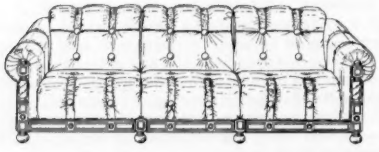
234,237
CHAIR
Maxine Gibson, 750 Congo St., San Francisco, Calif. 94131
Filed Mar. 8, 1973, Ser. No. 339,405
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—26



234,238
COMBINED TABLE AND MULTIPLE CHAIR UNIT FOR OUTDOOR USE
James E. Miller, Birmingham, Mich., assignor to Form, Incorporated, Livingston, Mich.
Filed Jan. 16, 1973, Ser. No. 324,203
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—45



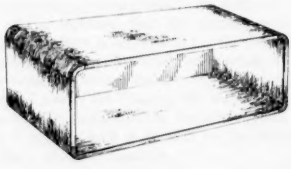
234,239
SOFA
Stapleton Long, 1629 Christmas Drive, Morristown, Tenn. 37814
Filed Nov. 28, 1972, Ser. No. 310,017
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



234,240
CHAIR
Akihiko Noda and Kunio Onoguchi, Tokyo, Japan, assignors to France Bed Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1973, Ser. No. 336,482
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—70

234,241
CHAIR
Kunio Onoguchi, Tokyo, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1973, Ser. No. 336,439
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—76

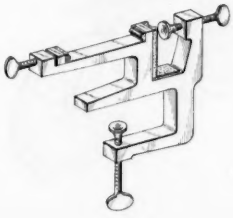
234,242
CABINET FOR A WALL SYSTEM
Joseph Reiter, 11255 Suzor Cote, Montreal, Quebec, Canada
Filed Feb. 16, 1972, Ser. No. 227,016
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—130



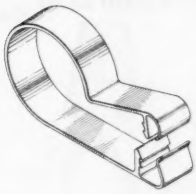
234,243
GARMENT HANGER LINKAGE
David H. Lindemann, 228 SW. 21st Terrace, Fort Lauderdale, Fla. 33304
Filed Jan. 26, 1973, Ser. No. 326,690
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—257

234,244
SPLICING ANVIL
Irwin Zahn, New York, N.Y., assignor to General Staple Company, Inc., New York, N.Y.
Filed July 10, 1972, Ser. No. 270,153
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—46

234,245
SKI VISE
Weldon L. McGee, 2512 S. Highway 100, Apt. 433, St. Louis Park, Minn.
Filed Aug. 15, 1973, Ser. No. 388,364
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—74



234,246
TENSION BAND
Leo J. Martini, South Gate, Calif., assignor to Master Fence Fittings, Inc., La Habra, Calif.
Filed June 29, 1973, Ser. No. 375,117
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—259



234,247
AEROSOL CONTAINER
Carol Schafer, 4022 Ingraham St., Los Angeles, Calif. 90005
Filed Dec. 22, 1969, Ser. No. 20,581
Term of patent 14 years
The term of this patent subsequent to Apr. 4, 1986, has been disclaimed
Int. Cl. D9—*01*
U.S. Cl. D9—9

234,248
AEROSOL CONTAINER
Carol Schafer, 4022 Ingraham St., Los Angeles, Calif. 90005
Filed Dec. 22, 1969, Ser. No. 20,584
Term of patent 14 years
The term of this patent subsequent to Feb. 4, 1986, has been disclaimed
Int. Cl. D9—*01*
U.S. Cl. D9—9

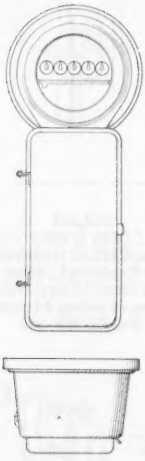
234,249
BOTTLE
John R. Holzaepfel, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Apr. 30, 1973, Ser. No. 355,835
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—71

234,250
COMBINED BOTTLE AND CAP THEREFOR
John R. Holzaepfel, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Jan. 12, 1973, Ser. No. 323,028
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—83

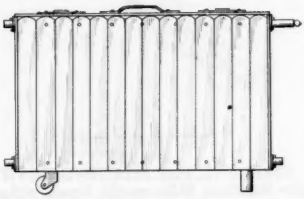
234,251
BEVERAGE BOTTLE OR THE LIKE
Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Continuation-in-part of abandoned design application Ser. No. 247,933, Apr. 26, 1972. This application May 23, 1973, Ser. No. 362,976
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—100

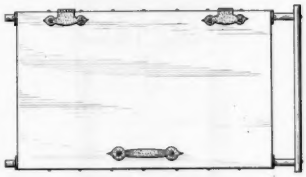
234,252
BOX
Ronald L. Gerson, Newton, Mass., assignor to Louis M. Gerson Co., Inc., Middleboro, Mass.
Filed Apr. 14, 1972, Ser. No. 244,350
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224

234,253
COMBINED ELECTRICAL LOAD RECORDER AND METER
Murray C. Carney, Springfield, Ill., assignor to Sangamo Electric Company, Springfield, Ill.
Filed Jan. 10, 1973, Ser. No. 322,380
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—75



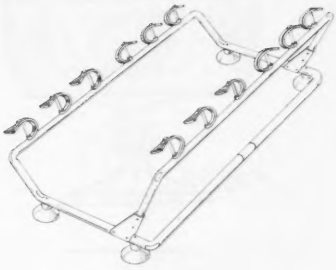
234,254
MOBILE TRASH RECEPTACLE
James Edwin Mead, Chatham, N.J.
(28 Burgess Place, Wayne, N.J. 07470)
Filed Mar. 5, 1973, Ser. No. 338,181
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—27



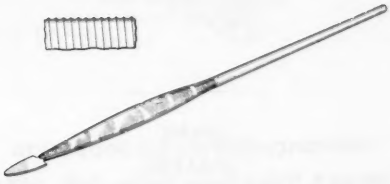


234,255
BICYCLE
Darwin Zenser, El Monte, Calif., assignor to Yamaha International Corporation, Buena Park, Calif.
Filed Jan. 21, 1974, Ser. No. 435,225
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—111

234,256
SKI CARRIER
Ronald W. Parsons, Tottenham, Ontario, Canada, assignor to A.L. & W. Limited, Bramalea, Ontario, Canada
Filed Jan. 8, 1974, Ser. No. 431,614
Claims priority, application Canada July 16, 1973
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157



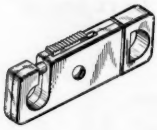
234,257
DENTAL GINGIVAL PACKING TOOL
Robert Philip Berger, 17110 Clemons Drive, Encino, Calif. 91316
Filed Dec. 29, 1969, Ser. No. 20,653
Term of patent 14 years
The term of this patent subsequent to Jan. 4, 1986, has been disclaimed
Int. Cl. D24—*02*
U.S. Cl. D24—1 D



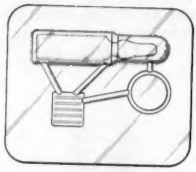
234,258
ELECTRIC LAMP BULB
Jack N. McCarthy, Meadowood Road, Tolland, Conn. 06084
Filed May 8, 1973, Ser. No. 358,286
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D26—8

234,259
VASE OR SIMILAR ARTICLE
Arthur L. Harshman, Dunkirk, Ind., and James I. Messmer, Detroit, Mich., assignors to Indiana Glass Company, Dunkirk, Ind.
Filed Sept. 21, 1973, Ser. No. 399,366
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—28 R

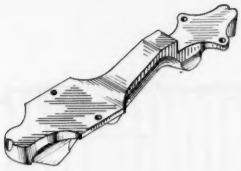
234,260
LATCH FOR PET LEASHES
Ness Eastman, Rego Park, N.Y., assignor to The Hartz Mountain Corporation, Harrison, N.J.
Filed Sept. 21, 1973, Ser. No. 399,557
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—39



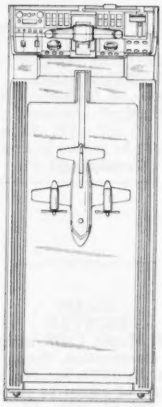
234,261
IDENTIFICATION KIT FOR BODY FLUID ANALYSIS
Edward B. Walton, Marina Del Rey, Calif. 90291
Filed Sept. 7, 1973, Ser. No. 395,224
Term of patent 14 years
Int. Cl. D24—*02;* D9—*04*
U.S. Cl. D32—1 R



234,262
ROLLER SKATE PLATE
John F. Willhoft, 5500 Myrtle St., Lincoln, Nebr. 68506
Filed Mar. 30, 1973, Ser. No. 346,697
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 C



234,263
AIRPLANE TOY PILOTING DEVICE
Yukio Sugihara, Mibu-machi, Japan, assignor to Toytown Corporation, Tokyo, Japan
Filed Nov. 16, 1972, Ser. No. 307,080
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AM



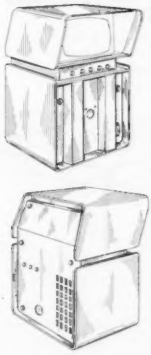
234,264
LANTERN
Kwong Yip Wan, Kowloon, Hong Kong, assignor to Chung Ah Manufacturing Company Limited, Kowloon, Hong Kong
Filed Oct. 23, 1973, Ser. No. 408,588
Claims priority, application Great Britain Sept. 25, 1973
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 R

234,265
ROOF FOR LIGHTING FIXTURE
Howard A. Daum, Hanover, Pa., assignor to Hadco Products, Inc., Littlestown, Pa.
Original Design Patent No. 199,143, dated Sept. 15, 1964, Ser. No. 74,610, Apr. 25, 1963. Application for reissue May 2, 1973, Ser. No. 335,134
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

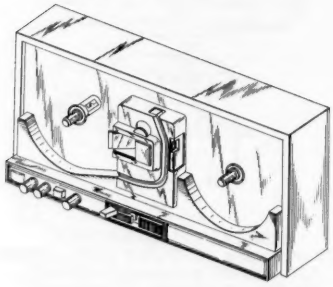
234,266
POINT OF SALE TERMINAL
Alfonso W. Merino, Edward J. Sabella, and Roger C. Williams, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 13, 1973, Ser. No. 369,617
Term of patent 14 years
Int. Cl. D14—*02;* D20—*02*
U.S. Cl. D52—4 A

234,267
POINT OF SALE TERMINAL
Alfonso W. Merino, Edward J. Sabella, and Roger C. Williams, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 13, 1973, Ser. No. 369,618
Term of patent 14 years
Int. Cl. D14—*02;* D20—*02*
U.S. Cl. D52—4 A

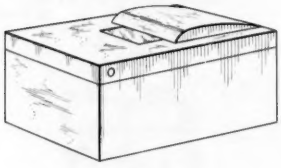
234,268
TELEVISION MICROSCOPE HOUSING
Michael D. Burridge, Santa Barbara, Calif., assignor to Circon Corporation, Goleta, Calif.
Filed Aug. 3, 1972, Ser. No. 277,797
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E



234,269
MOTION PICTURE PROJECTOR OR THE LIKE
Dianne B. Ainslie, 901 Elmgrove Road, Rochester, N.Y. 14650
Filed July 16, 1973, Ser. No. 379,904
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1 K



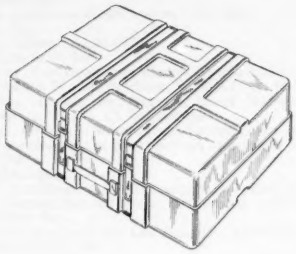
234,270
SOUND REDUCING COVER FOR TELEPRINTER, TICKET WRITER, OR THE LIKE
Berndt Ebbe Frick, 9 Herrgardsvagen, 135 00 Tyreso, Sweden
Filed Apr. 30, 1973, Ser. No. 355,432
Claims priority, application Sweden Dec. 18, 1972
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—11 R



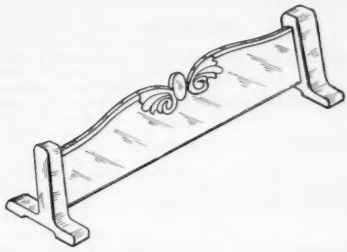
234,271
KNEE BRACE
Robert R. Moore, 5401 San Leandro St., Hayward, Calif. 94601
Filed Oct. 20, 1972, Ser. No. 299,210
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 J

234,272
FRAME OF MEDICAL X-RAY TELEVISION APPARATUS
Seijiro Umezono, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Nov. 27, 1972, Ser. No. 309,776
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 H

234,273
SHIPPING CONTAINER
Gregory K. Wilson, New Vernon, and Paul H. Lowman, Parsippany, N.J., assignors to William Bal Corporation, Elizabeth, N.J.
Filed Apr. 2, 1973, Ser. No. 346,728
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D87—1 R



234,274
NAMEPLATE
Alvin Seyler, Vintage St., Campbell City (or P.O. Box 428), Kissimmee, Fla. 32741
Filed Nov. 8, 1973, Ser. No. 413,838
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 F



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TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF FEBRUARY, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. J. Gerrard & Company: *See—*
Simich, Emil, 3,863,297.

A. O. Smith Corporation: *See—*
Wasson, Loerwood C., 3,864,234.

A/S Teknova: *See—*
Bonne, Adam; and Hogh, Jorgen, 3,863,666.

A-T-O Inc.: *See—*
Carter, Sidney T., 3,864,187.

AB Garphytte Bruk: *See—*
Ramqvist, Lars Henry; and Werme, Henrik, 3,864,221.

Abbate, Franklin W.; and Farrissey, William J., Jr., to Upjohn Company, The. Process for preparing novel N-(piperazinylethyl)-carbamates. 3,864,345, Cl. 260-268.00R.

Abbondanti, Alberto, to Westinghouse Electric Corporation. Arrangement of parallel static ac power sources proportions. 3,864,620, Cl. 321-27.00R.

Abbott Laboratories: *See—*
Fager, Earl Elmer; and Widenburg, Norman Earl, 3,864,492.
Stein, Herman Hal; and Prasad, Raj Nandan, 3,864,483.

Abe, Haruhiko: *See—*
Uematsu, Shigeyuki; and Abe, Haruhiko, 3,864,719.

Abercrombie, Roy F.: *See—*
Gatsos, Stephen L.; Abercrombie, Roy F.; and Ford, Charles R., 3,863,521.

Abernathy, Randolph; and Shepherd, Thomas L., to Airco, Inc. Combustion system for Flare Gas. 3,864,072, Cl. 431-5.000.

Abromavage, John C.; and Ryden, James W. Load damping frame hitch for vehicles towing a trailer. 3,863,954, Cl. 280-476.000.

Aburto, Carlos Mota. Inflatable umbrellas. 3,863,661, Cl. 135-20.00B.

Acuity Systems, Incorporated: *See—*
Cornsweet, Tom N., 3,864,030.

Adams, David: *See—*
Johnson, Paul A.; Adams, David; and Pinkalla, Hamilton A., 3,864,185.

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Korff, Roy D., 3,863,912.

Adkins, William J., to Corning Glass Works. Acquisition system for slide analysis. 3,864,564, Cl. 250-201.000.

Adler, Klaus; Bauer, Johann; Englbrecht, Rupert; Turba, Werner; Pichler, Englbert; and Maluschka, Adolf, to Wacker-Chemie GmbH. Process for the production of an elasticized thermoplastic polymer mixture in a pourable powder form. 3,864,432, Cl. 260-897.00B.

Affiliated Hospital Products, Inc.: *See—*
Baldwin, Brian E., 3,863,631.

Agence Nationale de Valorisation de la Recherche: *See—*
Courvalin, Patrice Marie Denis Paul, 3,863,426.

Agency of Industrial Science & Technology: *See—*
Kato, Masao; Hasegawa, Masaki; and Ichijyo, Taro, 3,864,308.

Agfa-Gevaert: *See—*
Timmerman, Daniel Maurice; and De Winter, Walter Frans, 3,864,158.
Van Paesschen, August Jean; Van Gossum, Lucien Janbaptist; and Priem, Jan Jozef, 3,864,128.
Van Regenmortel, Ludovicus Carolus, 3,863,600.

Agfa-Gevaert Aktiengesellschaft: *See—*
Mueller, Joachim; and Dengler, Ludwig, 3,863,602.
Rieder, Alois, 3,864,033.
Stievenari, Emile; and Muller, Jurgen, 3,863,360.
Vanheerentals, Jacques, 3,864,036.
Winkler, Alfred, 3,864,705.

Agnew, Kenneth Malcolm; Coward, Timothy; and Tomkin, Douglas Frazer, to National Research Development Corporation. Commodes. 3,863,276, Cl. 4-237.000.

Ahern, William P.: *See—*
Grindstaff, Donald A.; and Ahern, William P., 3,864,506.

Ahmed, Adel Abdel Aziz, to RCA Corporation. High-input-impedance amplifier. 3,864,641, Cl. 330-17.000.

Aihara, Toru: *See—*
Mitsuishi, Yoshiji; and Aihara, Toru, 3,863,741.

Air Preheater Company Inc., The: *See—*
Stockman, Richard F., 3,863,779.

Air Products and Chemicals, Inc.: *See—*
Casey, Jeremiah P.; McDowell, Curtis S.; Spector, Marshall L.; and Zupko, Alan J., 3,864,246.

Airco, Inc.: *See—*
Abernathy, Randolph; and Shepherd, Thomas L., 3,864,072.

Aisin Seiki Kabushiki Kaisha: *See—*
Eukumoto, Ryoichi, 3,863,293.

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Yamashita, Takashi; and Ninagawa, Sadayoshi, 3,864,370.

Akahane, Fumitake; Kobayakawa, Masaki; and Yawata, Kazufumi, to Nippon Electric Kagoshima, Limited. Luminescent display tube anode assembly comprising anode structures having channel-shaped conductive layers. 3,864,591, Cl. 313-496.000.

Akatsu, Mitsuhiro: *See—*
Katsube, Junki; Takashima, Yoshinori; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Akatsu, Mitsuhiro; Mori, Kazuo; Katsuki, Isao; Kume, Yoshiharu; Sato, Hiromi; Inaba, Shigeho; and Yamamoto, Hisao, 3,864,330.

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Simmons, Bjorn Herman Olof, 3,863,569.

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Vernede, Louis Antoine; Nitzki, Leopold; Liedke, Heinrich; and Schror, Friedrich, 3,863,585.

Aktiengesellshaft Adolf Saurer: *See—*
Viniczay, Gabriella Fuchs; Hutter, Wilhelm; and Bohme, Rudolf-Karl, 3,864,040.

Albert Rolland S.A.: *See—*
Thuillier, Yvonne; and Perrault, Marcel Antoine, 3,864,477.

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Biel, John Hans; and Klundt, Irwin L., 3,864,386.

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Allen, Brian S. Automatic photographic apparatus and postcard vending machine. 3,864,708, Cl. 354-290.000.

Allied Chemical Corporation: *See—*
Bedell, John R.; and Wellslager, John A., 3,863,700.
McDowell, John W.; and Winstrom, Leon O., 3,864,399.

Allied Leisure, Inc.: *See—*
Michrina, Regis C., 3,863,727.

Allis-Chalmers Corporation: *See—*
Barth, John W., 3,863,951.
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Hartwig, Walter J., 3,863,755.
Whitaker, Orion C.; and Heian, Glenn A., 3,864,119.

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Allred, Arthur L., 3,863,823.

Alongi, Thomas R.: *See—*
Elders, Gerald W.; Alongi, Thomas R.; Schneider, Thomas E., deceased; and Schneider, Thomas R., administrator, 3,863,825.

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Altieri, Frederick J. Solution for permanent cold waving or straightening of hair. 3,864,476, Cl. 424-71.000.

Aluminum Company of America: *See—*
Forschner, Robert H.; and Kushner, Robert J., 3,863,531.
Fox, D. Marshall; and Weiss, Richard B., 3,864,507.
Gurganus, Thomas B.; and Grubb, Leland L., 3,863,325.
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Arnold, Alanson J. Method of Distilling Sea Water on Small Ships and Marine Platforms Having Internal Combustion Engine. 3,864,215, Cl. 203-11.000.
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Becker, Joseph T. Cam device for aligning and turning moving toy. 3,863,385, Cl. 46-1.00H.
Becker, Robert Sidney; Painter, Eric Frank; and Rickard, Gerrard Charles, to Gresham Infomaq Ltd. Transducer head with spacer material made of stainless steel. 3,864,753, Cl. 360-121.000.
Beckers, Norman L., to Diamond Shamrock Corporation. Methylene chloride stabilized with methyl acetate. 3,864,408, Cl. 260-652.50R.
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Bickford, David Edward, to AMP Incorporated. Seat belt warning and ignition interlock system. 3,864,668, Cl. 340-52.00E.

Biel, John Hans; and Klundt, Irwin L., to Aldrich Chemical Company. Di-substituted beta-phenethylcarbbamic acid esters. 3,864,386, Cl. 260-471.00C.

Bienert, Horst. Automobile sliding roof with canopy frame. 3,863,979, Cl. 296-137.00E.

Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., to Hughes Aircraft Company. Copolymer of polyimide oligomers and terephthalonitrile n,n-dioxide and their methods of preparation. 3,864,309, Cl. 260-47.0UA.

Biscardi, Salvatore F., to General Foods Corporation. Treatment of hyperkinetic conditions with caffeine. 3,864,489, Cl. 424-253.000.

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Blunck, Otto; and Retzow, Karl-Heinz, to H. Maihak A.G. Method of and apparatus for avoiding erroneous indications as a result of the properties of the paper in apparatus which use a paper tape as measuring means. 3,863,490, Cl. 73-28.000.

Bobrov, Anatoly Borisovich, deceased: *See—*
Bobrov, Vyacheslav Borisovich; Buzhinskaya, Antonina Vladimirovna; Semenenko, Vadim Afanasievich; Bobrov, Anatoly Borisovich, deceased; and Evdokia Nikolaevna Bobrova, administrator, 3,864,235.

Bobrov, Vyacheslav Borisovich; Buzhinskaya, Antonina Vladimirovna; Semenenko, Vadim Afanasievich; Bobrov, Anatoly Borisovich, deceased; and Evdokia Nikolaevna Bobrova, administrator. Loop electrolyzer. 3,864,235, Cl. 204-206.000.

Bodycomb, Alistair K.; Meiel, Samuel P.; Shebry, Cameron W.; and Thompson, Garth N., to Domtar Limited. Easily dismantled partition structure. 3,863,412, Cl. 52-483.000.

Boehringer Mannheim G.m.b.H.: *See—*
Barker, Sidney Alan; Somers, Peter John; and Hatt, Brian William, 3,864,166.

Boeing Company, The: *See—*
Souslin, Richard Ervin; Klansnic, James E.; and Kahler, Charles, 3,863,867.

Bohme, Ekkehard; and Dolfini, Joseph E., to E. R. Squibb & Sons, Inc. Process for the preparation of Δ^3-cephalosporin aldehydes. 3,864,338, Cl. 260-243.00C.

Bohme, Rudolf-Karl: *See—*
Viniczay, Gabriella Fuchs; Hutter, Wilhelm; and Bohme, Rudolf-Karl, 3,864,040.

Boke, Artur Olov, to Saab-Scania Aktiebolag. Lock nut cooperable with electrical terminal block. 3,864,003, Cl. 339-198.00R.

Bolen, Robert J., to Remington Arms Company, Inc. Method for trimming cartridge cases. 3,863,529, Cl. 82-47.000.

Boliden Aktiebolag: *See—*
Jensfelt, Torsten Eli; and Gorling, Karl Goran, 3,864,121.

Boltz, Charles D., Jr., to RCA Corporation. Control signal apparatus for video disc player. 3,864,733, Cl. 360-33.000.

Bolwijn, Pieter Tammo: *See—*
Schott, Cornelis Johannes; Ponjee, Johannes Jacobus; Van Doorn, Rudolf Alexander; and Bolwijn, Pieter Tammo, 3,864,589.

Bon, David R., to United States of America, Navy. Floating electrode holding apparatus. 3,864,663, Cl. 340-4.00R.

Bond, Frank D., Jr.: *See—*
Schmidt, Craig M.; Bond, Frank D., Jr.; and McKenna, Ronald F., 3,863,442.

Bonded Carpets Limited: *See—*
Coates, Herbert, 3,864,190.

Bongianni, Wayne L., to Rockwell International Corporation. Substantially linear magnetic dispersive delay line and method of operating it. 3,864,647, Cl. 333-30.00M.

Bonhard, Klaus. Storage-stable hemoglobin solutions and method for their preparation. 3,864,478, Cl. 424-101.000.

Bonne, Adam; and Hogh, Jorgen, to A/S Teknova. Assembly for insertion in a fluid conduit. 3,863,666, Cl. 137-269.000.

Boots Pure Drug Company Limited: *See—*
Harrison, Ian Robert; McCarthy, John Felix; and Palmer, Bryan Harper, 3,864,497.

Borianne, Henri Marie Leon. Bridge playing devices. 3,863,362, Cl. 35-8.00B.

Bornhorst, Walter J., to Thermo Electron Corporation. Vacuum filled liquid container with cut-off valve. 3,863,663, Cl. 137-205.000.

Borsanyi, Alexander S., to American Hospital Supply Corporation. Pressure gauge protector assembly and method. 3,863,504, Cl. 73-395.000.

Borst, Gaylord M., to Outboard Marine Corporation. Combined damping and lift means for marine propulsion device. 3,863,592, Cl. 115-17.000.

Borst, Gaylord M.; and Shimanckas, William J., to Outboard Marine Corporation. Rotary cable steering system. 3,863,593, Cl. 115-18.00R.

Bosnich, Angelo J. Self-leveling and swiveling chair. 3,863,587, Cl. 114-191.000.

Bott, Winston F. Awning or marquee. 3,863,415, Cl. 52-630.000.

Botta, Alberto: *See—*
Wellinger, Roger Paul; Vauthier, Francis Andre; and Botta, Alberto, 3,863,338.

Bottcher, Albert; and Maass, Hans, to Franz Kuhlmann KG. Pattern transmitting devices. 3,863,543, Cl. 90-13.00C.

Boudouris, Georges; Kalopissis, Gregoire; Levesquf, Jean-Luc; and Roussopoulos, Paul, to Societe Anonyme dite: L'Oreal. Method for treating fibers by subjecting them to high frequency electric fields. 3,863,653, Cl. 132-33.000.

Bouffard, Pierre. Mouth exploring device. 3,863,627, Cl. 128-10.000.

Boulogne, Jean: *See—*
Morane, Bruno P.; and Boulogne, Jean, 3,863,654.

Boussely, Jean, to Societe Sapchim-Fournier-Cimag. Forming synthetic material with glyceryl trimontanate as a lubricant. 3,864,295, Cl. 260-28.50D.

Bouvier, John J.: *See—*
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Boxberger, Raymond Robert: *See—*
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Boyd, Newton A. Portable mine stoppings. 3,863,554, Cl. 98-50.000.

Boyd, Thomas H.: *See—*
Morin, Albert Z.; and Boyd, Thomas H., 3,864,252.

Bozzato, Giuliano; and Pesaro, Mario, to Givaudan Corporation. Novel odorants. 3,864,285, Cl. 252-522.000.

Brackin, Wayne L., to Dresser Industries, Inc. Changing block hoisting system. 3,863,898, Cl. 254-194.000.

Bradbury, David Charles; and Brown, George Henry, to Lucas Electrical Company Limited, The. Electrical switches. 3,864,654, Cl. 337-135.000.

Braginski, Aleksander I., to Westinghouse Electric Corporation. Fabrication of ferrite film for microwave applications. 3,864,165, Cl. 117-235.000.

Brandt, Dennis L., to Weyerhaeuser Company. Skyline carriage. 3,863,774, Cl. 212-94.000.

Brandt, Robert E., to Bunker Ramo Corporation. Concentrator system for particulates suspended in air. 3,864,106, Cl. 55-288.000.

Branson Instruments, Incorporated: *See—*
Shoh, Andrew, 3,863,826.

Braxton Corporation: *See—*
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Brehmer, John; Brewer, Russell C.; and Robinson, John W., to Stewart-Warner Corporation. Agitator assembly for mixing paint. 3,863,903, Cl. 259-108.000.

Brendgord, Thomas; and Copeland, Robert D., to American Sterilizer Company. Sit-up bathtub and shower. 3,863,275, Cl. 4-173.000.

Brennan, John F.; and Bloch, Herman S., to Universal Oil Products Company. Isomerization process. 3,864,424, Cl. 260-683.200.

Bresnick, Stuart D.: *See—*
Denning, Richard F.; and Bresnick, Stuart D., 3,864,220.

Bresson, Clarence R.; and Spaulding, Forrest D., to Phillips Petroleum Company. Impervious barrier comprising polyolefin fabric, asphalt and asbestos. 3,864,157, Cl. 117-138.80E.

Breton, Ernest J.; Wolf, Jack D.; and Worden, Dexter, to Composite Sciences, Inc. Process for producing sintered articles from flexible preforms containing polytetrafluoroethylene and at least about 85 volume percent of sinterable particulate material. 3,864,124, Cl. 75-212.000.

Brewer, Russell C.: *See—*
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Bridgestone Tire Company Limited: *See*—
Yukuta, Toshio; Ohashi, Takashi; Taniguchi, Yoshiko; and Arai, Katsuhiko, 3,864,324.

Bridwell, John W.; Leighty, Conard E.; and Wellwood, John G., to Caterpillar Tractor Company. Steering clutch actuating system. 3,863,744, Cl. 192-91.00R.

Briggs Stratton Corporation: *See*—
Thompson, Robert G.; and Gund, Heinz K., 3,863,614.

Bright, James A., to General Motors Corporation. Tray ice maker with ice level sensing control. 3,863,461, Cl. 62-137.000.

Brighton Corporation Ltd.: *See*—
Hata, Hideaki, 3,863,794.

Brink, Robert H., Jr.: *See*—
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, 3,864,253.

Brinker, Francis R.; Roeschlfin, Eugene R.; and Zeph, David L., to United States of America, Navy. Bearing display device for a plurality of targets. 3,864,555, Cl. 235-150.200.

Bristol-Myers Company: *See*—
Berghahn, Walter G., 3,863,797.

British Hovercraft Corporation Limited: *See*—
Crewe, Peter Rowland, 3,863,732.

British Mathews Limited, The: *See*—
Harman, Frederick George, 3,863,776.

British Petroleum Company Limited, The: *See*—
Pellett, Jacques Pierre; Baisan, Henri Bernard Andre; Lievaux, Jean; and Patchett, Georges, 3,864,577.

British Steel Corporation: *See*—
Hinchcliffe, Alan; and Johnson, Kenneth, 3,864,164.

Broadhead, John; Di Salvo, Francis Joseph, Jr.; and Trumbore, Forrest A., to Bell Telephone Laboratories, Incorporated. Non-aqueous battery using chalcogenide electrode. 3,864,167, Cl. 136-6.0LN.

Brock, Gibson E. Self-loading coil carrier. 3,863,785, Cl. 214-130.00C.

Brock, Gibson E. Self-loading slag pot transporter. 3,863,791, Cl. 214-314.000.

Broerse, Pieter Hendrik: *See*—
Wesselink, Gustaaf Adolf; Bleckrode, Richard; Roelofs, Hendrik; and Broerse, Pieter Hendrik, 3,864,599.

Brook, Helmut: *See*—
Schafer, Wolfgang; and Brook, Helmut, 3,864,545.

Brookman, Roger S., to American Precision Industries, Inc. Dust collector with jet induced reverse air cleaning. 3,864,108, Cl. 55-302.000.

Brotzmann, Karl: *See*—
Knuppel, Helmut; Brotzmann, Karl; Fassbinder, Hans Georg; and Wurm, Peter, 3,864,120.

Brown, David A., to Shugart Associates, Inc. Apparatus for polishing a spherical surface on a magnetic recording transducer. 3,863,395, Cl. 51-121.000.

Brown, Gary G.: *See*—
Crandall, Walter E.; Mills, George J.; and Brown, Gary G., 3,864,184.

Brown, George Henry: *See*—
Bradbury, David Charles; and Brown, George Henry, 3,864,654.

Brown, Roland Clough. Instant valve insert. 3,863,697, Cl. 152-427.000.

Brown, Ronald W., to Thermo King Corporation. Condition responsive control device. 3,864,657, Cl. 337-311.000.

Brown, William: *See*—
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Brown & Williamson Tobacco Corporation: *See*—
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Hunt, Frederick J., 3,863,644.

Browning Arms Company: *See*—
Browning, Bruce W., 3,863,375.

Browning, Bruce W., to Browning Arms Company. Trigger system. 3,863,375, Cl. 42-69.00R.

Bruen, Charles P.; and Kelly, Donald H., to Reynolds Metal Company. Process for producing alumina monohydrate from basic aluminum nitrates. 3,864,462, Cl. 423-631.000.

Bruist, Edmond H., to Shell Oil Company. Cementing procedure for avoiding mud channeling. 3,863,718, Cl. 166-285.000.

Brumlik, George C., to Ingrip Fasteners Inc. Linear fastening element and method therefore. 3,863,304, Cl. 24-204.000.

Bruns, Andrew Reiner, to Textronix, Inc. Apparatus for processing recording material. 3,864,709, Cl. 354-297.000.

Bruun, Herta: *See*—
Feit, Peter Werner; and Bruun, Herta, 3,864,385.

Bryers, Richard W.; and Shenker, Jack D., to United States of America, U.S. Environmental Protection Agency. Vapor generating system utilizing fluidized beds. 3,863,606, Cl. 122-4.00D.

Brytczuk, Walter L.; and Hauser, Milton J., to Amax Inc. Method for the electrolytic refining of copper. 3,864,227, Cl. 204-108.000.

Bryzinsky, Frank M.: *See*—
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Bucalo, Louis, to Microbyx Corporation. Culturing method. 3,864,213, Cl. 195-103.50R.

Buchmuller, Josef: *See*—
Muncke, Ludwig; Gross, Gerhard; and Buchmuller, Josef, 3,863,955.

Buckley, Lawrence Webb; Daniels, Raymond Alex; Froula, James Dewayne; Knight, Arthur Holt; Stapleton, Dale Cliffton; and Williams, George Thomas, to International Business Machines Corporation. Magnetic brush roll having resilient polymeric surface. 3,863,603, Cl. 118-637.000.

Buell, Kenneth B., to Procter & Gamble Company, The. Process for preparing airfelt. 3,863,296, Cl. 19-156.300.

Buffet Crampon: *See*—
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Buike, Melvin L.: *See*—
Grazen, Frank S.; Buike, Melvin L.; and Bryzinsky, Frank M., 3,864,304.

Building Components Research, Inc.: *See*—
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Bumpstead, John G., to Rain Bird Sprinkler Mfg. Corporation. Emitter for low rate, low pressure discharge of irrigating water. 3,863,845, Cl. 239-542.000.

Bunker Ramo Corporation: *See*—
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Burbine, William G.: *See*—
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Bureau BBR Ltd.: *See*—
Welbergen, Gerard; and Seigwart, Hans Rudolf, 3,863,302.

Burg, Richard W.: *See*—
Miller, Brinton M.; and Burg, Richard W., 3,864,479.

Burger, Simon, to Heinrich Wunder KG. Ski binding. 3,863,942, Cl. 280-11.35A.

Burgess, Edward S. End of message unit for use in push to talk microphones. 3,864,746, Cl. 360-97.000.

Burns, Bernard J.: *See*—
Diamond, Julius; Douglas, George H.; and Burns, Bernard J., 3,864,496.

Burova, Svetlana Fedorovna: *See*—
Simonov, Vadim Dmitrievich; Ivanov, Anatoly Vasilievich; Kogan, Lev Markovich; Ljubarsky, Markus Vladimirovich; Dremin, Gennady Timofeevich; Voronenko, Boris Ivanovich; and Burova, Svetlana Fedorovna, 3,864,414.

Burroughs Corporation: *See*—
Davis, Martin F.; Schwanauer, Francis J.; Walenta, Ivan E.; and Walker, Gary J., 3,864,735.
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Busch, Francis W., Jr., to Cheseborough-Pond's, Inc. Gelled coating compositions and method of making same. 3,864,294, Cl. 260-28.50A.

Busch, William J.; and Dey, Ervin J., to Standard Pressed Steel Co. Self-retained panel fastener assembly. 3,863,421, Cl. 52-758.00F.

Busenkell, Charles C., to United States of America, Navy. Compensated fluidic bearing clearance monitor. 3,863,493, Cl. 73-37.500.

Bush, Elsmore W.: *See*—
DeKozan, Raymond L.; Salkeld, Edwin M., Jr.; and Bush, Elsmore W., 3,864,522.

Butka, Kemal. Mechanical pencil, especially for thin leads. 3,864,046, Cl. 401-53.000.

Butschkau, Hans. Electric battery provided with a safeguard against short-circuitings. 3,864,173, Cl. 136-181.000.

Butuzov, Alexei Vasilievich: *See*—
Titov, Dmitry Vladimirovich; Makachev, Nikolai Ivanovich; Sidorov, Jury Pavlovich; Filatova, Tatyana Konstantinovna; Butuzov, Alexei Vasilievich; Selivanov, Anatoly Grigorievich; and Dyachkov, Alexandr Mikhailovich, 3,863,680.

Butzow, Neil W.; Eggert, Glenn J.; Krivec, Bert; and Rollinger, Gary J., to Rexnord, Inc. Article unloader. 3,863,781, Cl. 214-62.00R.

Buuck, Robert Enno. Incontinence system and methods of implanting and using same. 3,863,622, Cl. 128-1.00R.

Buzhinskaya, Antonina Vladimirovna: *See*—
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Cahnman, Hugo N.; Sterne, Frank; and Canfield, Douglas M., to Caso-Solar. System for irradiating a discontinuously moving web. 3,864,546, Cl. 219-354.000.

Cairns, Hugh; and Minshull, Robert, to Fisons Limited, Felixstowe. Compositions and methods for the prevention of asthmatic symptoms. 3,864,493, Cl. 424-283.000.

Cairns, John Francis: *See*—
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Cale, Roland E., to Schaefer Equipment Company. Method of making a forging die. 3,863,525, Cl. 76-107.00R.

California Progressive Products, Inc.: *See*—
Crawley, James W., 3,863,512.

Callahan, Bernard E., to Vapor Corporation. Vehicle data recorder employing data compression. 3,864,731, Cl. 360-5.000

Campagnuolo, Carl J.; and Holmes, Allen B., to United States of America, Army. Fluidic battery activator. 3,863,571, Cl. 102-81.000.

Campagnuolo, Carl J.; and Peer, Charles F., to United States of America, Army. Fluidic safing-arming system. 3,863,572, Cl. 102-81.000.
Campbell, Donald A.: *See—*
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Campbell, Douglas R.; and Priegnitz, James W., to Universal Oil Products Company. Separation of tetra-alkyl substituted aromatic hydrocarbon isomers. 3,864,416, Cl. 260-674.00A.
Camras, Marvin, to IIT Research Institute. Video transducing apparatus. 3,864,729, Cl. 358-4.000.
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Carbide Form Grinding, Inc.: *See—*
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Carr, Dwight W. Support bracket for concrete form. 3,863,886, Cl. 249-192.000.
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Carrier, Vernon J. Door stop. 3,863,967, Cl. 292-158.000.
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Carter, Sidney T., to A-T-O Inc. Labeling machine. 3,864,187, Cl. 156-364.000.
Cartlidge, Albert Joseph; and Shuttleworth, Frank, to Platt International Limited. Package take-up control for stuffer box crimpers. 3,863,311, Cl. 28-1.700.
Casey, Jeremiah P.; McDowell, Curtis S.; Spector, Marshall L.; and Zupko, Alan J., to Air Products and Chemicals, Inc. Non-bulking activated sludge process. 3,864,246, Cl. 210-7.000.
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Cavalieri, Michel, to Tractel S. A. Cable traction and hoisting apparatus. 3,863,893, Cl. 254-76.000.
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Mansi, Joseph S.; and Spence, Larry W., 3,863,894.
Charpentier, Maurice, to Saint-Gobain. Cellular, resinous products and methods and apparatus for making them. 3,863,908, Cl. 264-45.50A.
Charvat, Vernon K., to Sherwin-Williams Company, The. Process for preparing a resin-bonded grinding article containing stress-absorbing particulate material. 3,864,101, Cl. 51-298.000.
Chase-Shawmut Company, The: *See—*
Kozacka, Frederick J., 3,864,655.
Chekotilo, Leonty Vasilievich: *See—*
Medovar, Boris Izrailevich; Lanevsky, Valery Evgenievich; Alferov, Jury Fedorovich; Dubinsky, Rudolf Solomonovich; Berezovsky, Mikhail Elevich; Chekotilo, Leonty Vasilievich; Pavlov, Leonid Viktorovich; Ishunkin, Veniamin Alexandrovich; Shevtsov, Anatoly Ivanovich; and Grinshpon, Semen Yakovlevich, 3,863,699.
Chem Par Corporation: *See—*
Sarka, Albert J.; and Kang, Pierson S., 3,863,550.
Chemical Comminutions International, Inc.: *See—*
Keller, Douglas V., Jr.; and Smith, Clay D., 3,863,846.
Chemische Werke Huels Aktiengesellschaft: *See—*
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Cheseborough-Pond's, Inc.: *See—*
Busch, Francis W., Jr., 3,864,294.

Chevalier, Gabriel; and Rouxel, Roland, to Societe Generale de Constructions Electriques et Mecaniques (Alsthom). Time delay compensation in a closed-loop process control system. 3,864,554, Cl. 235-150.100.

Chevron Research Company: *See—*
Anderson, Robert G., 3,864,286.
Cleveland, James D., 3,864,342.
Clippinger, Everett; and Mulaskey, Bernard F., 3,864,284.
Honnen, Lewis R., 3,864,098.
Hughes, Thomas R., 3,864,417.
Schneider, Ronald A., 3,864,280.

Chi, Chang W.; Lee, Hanju; and Maher, Philip K., to W. R. Grace & Co. Process for purifying sulfur compound contaminated gas streams. 3,864,452, Cl. 423-244.000.

Chia, Chu-jen; Currah, Jack Ellwood; and Lusby, George Russell, to Canadian Industries, Limited. Manufacture of alkali metal xanthates. 3,864,374, Cl. 260-455.00B.

Chicago Bridge & Iron Company: *See—*
O'Brien, Richard Edward; and Simpson, Arthur Raymond, 3,863,902.

Child, Edward T.; May, John E.; and Stephanek, William D., to Texaco Inc. Means and method for controlling the strength of acid in an alkylation unit. 3,864,346, Cl. 260-283.590.

Chin, John W. G.: *See—*
Shapiro, Justin Joel; and Chin, John W. G., 3,863,807.

Chinoin Gyogyszer-Es Vegyeszeti Termekek Gyara Rt.: *See—*
Feuer, Laszlo; Nogradi, Mihaly; Gottsegen, Agnes; Vermes, Borbala; Streliszky, Janos; Wolfner, Andras; Farkas, Lorant; Antus, Sandor; Kovacs, Maria; and Toth, Nee, 3,864,362.

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Casey, John E., Jr; and Chireau, Roland F., 3,864,168.

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Christensson, Od Wikar, to Christenssons Maskiner & Patenter AB. Liquid and gas sealing cardboard package. 3,863,830, Cl. 229-14.0BA.

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Christensson, Od Wikar, 3,863,830.

Christiansen, Soren Bent, to F. L. Smidth & Co. Apparatus for burning granular or pulverous material. 3,864,075, Cl. 432-106.000.

Christine, William C.; and Watt, William E. R., to Inpaco. Dispensing Rack and Package. 3,863,809, Cl. 222-105.000.

Ciaudelli, Joseph P., to Avon Products, Inc. Substantive polymeric sunscreen composition. 3,864,473, Cl. 424-60.000.

Ciba-Geigy AG: *See—*
Martin, Henry; Rohr, Otto; Duerr, Dieter; Janiak, Stefan; Pissiotas, Georg; and Toepfl, Werner, 3,864,395.
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Ciba-Geigy Corporation: *See—*
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Porret, Daniel; and Habermeier, Jurgen, 3,864,358.

Cincinnati Electronics Corporation: *See—*
Bez, Robert V., 3,864,567.

Ciner, Elliot. Geriatric chair. 3,863,980, Cl. 297-69.000.

Clardy, Edwin K.: *See—*
Ayers, Buell O.; and Clardy, Edwin K., 3,863,489.

Clark, David C.: *See—*
Bergstrom, Darryl K.; and Clark, David C., 3,863,355.
Knapp, Ralph E.; and Clark, David C., 3,863,357.

Clark, Franklin P.: *See—*
Sinclair, John T.; and Clark, Franklin P., 3,864,095.

Clark, Lloyd. Tire splash guard. 3,863,949, Cl. 280-156.000.

Clemens, Jules R.: *See—*
Stillman, Irving M.; Trowe, Neil M.; and Clemens, Jules R., 3,864,571.

Cleveland, James D., to Chevron Research Company. Herbicidal n-substituted-dithioamino and n-substituted- oxythioamino triazines. 3,864,342, Cl. 260-249.800.

Cline, Carl F.; and Wilkins, Mark L., to United States of America, Army. Beryllium boride armor. 3,863,541, Cl. 89-36.00A.

Cline, Vance Allen. Exercising devices. 3,863,916, Cl. 272-81.000.

Clippinger, Everett; and Mulaskey, Bernard F., to Chevron Research Company. Platinum-tin catalyst on an alumina carrier. 3,864,284, Cl. 252-466.0PT.

Closner, John J.; Marchaj, Tadeusz Josef; and Wichman, Sven Hjalmar, to Preload Technology, Inc. Prestressed concrete tanks for liquid natural gas tankers. 3,863,408, Cl. 52-224.000.

Coates, Herbert; to Bonded Carpets Limited. Apparatus for manufacturing carpeting. 3,864,190, Cl. 156-443.000.

Cobaugh, Robert Franklin: *See—*
Coller, James Ray; and Cobaugh, Robert Franklin, 3,864,000.

Cogsdill Tool Products, Inc.: *See—*
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Cohen, Marvin M., to United States of America, Army. Tunneling electroluminescent diode with voltage variable wavelength output. 3,864,721, Cl. 357-17.000.

Cohen, Melvin. Magazine rack. 3,863,768, Cl. 211-49.00D.

Coit International Inc.: *See—*
Ballard, Lee R.; and Harris, Joe G., 3,863,866.

Colchester, John Edward; Cairns, John Francis; and Carey, John Gerard, to Imperial Chemical Industries Limited. Manufacture of bipyridylium salts. 3,864,352, Cl. 260-295.0AM.

Cole, Edward L.: *See—*
Franz, William F.; Hess, Howard V.; Cole, Edward L.; and Neisser, Kenneth E., 3,864,205.
Hess, Howard V.; Franz, William F.; and Cole, Edward L., 3,864,254.

Cole, Henry B., to American Optical Corporation. Optical fiber arc-to-line converter. 3,864,017, Cl. 350-96.00B.

Coleman Company, Inc., The: *See—*
Hershey, Gerald, 3,863,963.

Coleman, Michael G., to Motorola, Inc. Aluminum-zinc metallization. 3,863,334, Cl. 29-590.000.

Colgate-Palmolive Company: *See—*
Gerecht, John Fred, 3,864,474.
King, William James; Murray, Leo Thomas; and Salzmann, Gerhard Martin, 3,864,471.
Pensak, Philip; and Januszewski, Joseph P., 3,864,472.
Sundby, Bjorn; Kenney, Edward J.; and Wixon, Harold E., 3,864,389.

Colibert, Floyd A. Motion responsive switch and alarm system. 3,864,675, Cl. 340-224.000.

Coller, James Ray; and Cobaugh, Robert Franklin, to AMP Incorporated. Mating contact connector housing assembly. 3,864,000, Cl. 339-64.00M.

Colwell, Robert E., to Continental Can Company, Inc. Method of Regeneration spent Iron Electroplating Solutions with Concomitant Desulfurization of Coal. 3,864,223, Cl. 204-48.000.

Combustion Engineering Inc.: *See—*
Blaskowski, Henry John, 3,864,100.

Combustion Equipment Associates, Inc.: *See—*
Lyshkow, Norman A., 3,864,044.

Commissariat a l'Energie Atomique: *See—*
Audenard, Bernard; Pigeon, Michel; and Stach, Claude, 3,864,638.

Commonwealth Scientific and Industrial Research Organization: *See—*
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Communication Equipment & Contracting Co., Inc.: *See—*
Pirnie, Robert M., Jr.; and Pirnie, Robert M., III, 3,864,526.

Communicators, Inc., The: *See—*
Smith, Norval F., 3,863,370.

Compagnie des Services Dowell Schlumberger: *See—*
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Compagnie Industrielle de Textiles Artificiels et Syntheliques: *See—*
Guyot, Raymond, 3,863,683.

Compatible Controls Systems, Inc.: *See—*
Watson, David Reed, Jr., 3,863,714.

Composite Sciences, Inc.: *See—*
Breton, Ernest J.; Wolf, Jack D.; and Worden, Dexter, 3,864,124.

Computer Transmission Corporation: *See—*
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Conlon, Bartholomew F., Jr., to General Electric Company. Tape reel drive mechanism. 3,863,856, Cl. 242-68.300.

Connell, Joseph A., to NRG Incorporated. Method for removing hydrogen sulfide from hydrocarbon gas streams without pollution of the atmosphere. 3,864,460, Cl. 423-574.000.

Connelly, Frank J., to Hercules Incorporated. Molding compositions. 3,863,758, Cl. 206-84.000.

Conrad, Lucas J.; Leonard, Gerard E.; and Simmons, Gary J., to R. J. Reynolds Company. Reciprocating conveyor. 3,863,756, Cl. 198-220.0CC.

Continental Can Company, Inc.: *See—*
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Continental Oil Company: *See—*
Bahjat, Dhari S., 3,864,667.
Yates, James E., 3,864,407.

Cooper, Robert Ernest, to Compagnie des Services Dowell Schlumberger. Methods for forcing a liquid into a low pressure formation. 3,863,717, Cl. 166-279.000.

Copeland, George G., to Copeland Systems Incorporated. Apparatus for producing ammonia-base pulping liquor from spent liquor. 3,864,192, Cl. 159-4.00A.

Copeland, Robert D.: *See—*
Brendgord, Thomas; and Copeland, Robert D., 3,863,275.

Copeland Systems Incorporated: *See—*
Copeland, George G., 3,864,192.

Copperweld Steel Company: *See—*
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Janssen, John E.; Kardashian, Vahram S.; and Corbero, Paul Antonio, 3,863,501.

Corning Glass Works: *See—*
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Dumbaugh, William H., Jr.; and Schultz, Peter C., 3,864,113.
Patykula, Thomas E., 3,863,565.

Cornsweet, Tom N., to Acuity Systems, Incorporated. Eye position measuring technique. 3,864,030, Cl. 351-7.000.

Corona Controls, Inc.: *See—*
Chang, Thomas C., 3,864,611.

Corrugated Packing and Sheet Metal Company Limited, The: *See—*
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Coscia, Anthony Thomas: *See—*
Panzer, Hans Peter; Firth, William Charles, Jr.; Coscia, Anthony Thomas; and Palmer, Lucille Elma, 3,864,392.

Cosco, Inc.: *See*—
Olson, Ogden R., 3,863,875.

Cotton, Joseph Bernard; Hayfield, Peter Charles Steele; and Scholes, Ian Robert, to Imperial Metal Industries (Hynoch) Limited. Preparation of oxides. 3,864,224, Cl. 204-56.00R.

Coulter Electronics, Inc.: *See*—
Jones, Alan Richardson; and Godin, Thomas J., 3,863,507.

Coulter Information Systems, Inc.: *See*—
Kuehnle, Manfred R., 3,864,035.

Courvalin, Patrice Marie Denis Paul, to Agence Nationale de Valorisation de la Recherche. Disc transfer devices to petri dishes. 3,863,426, Cl. 53-237.000.

Cousins, Boyd E. Mirror bracket. 3,863,883, Cl. 248-477.000.

Coward, Timothy: *See*—
Agnew, Kenneth Malcolm; Coward, Timothy; and Tomkin, Douglas Frazer, 3,863,276.

Cowden, Herbert B.: *See*—
Rasch, Arthur A.; Cowden, Herbert B.; and Sullivan, David P., 3,864,132.

Cowdrick, Oakley. Apparatus for finishing a foil. 3,863,399, Cl. 51-151.000.

Cragoe, Edward J., Jr.: *See*—
Schultz, Everett M.; and Cragoe, Edward J., Jr., 3,864,401.

Cragon, Harvey George, to Texas Instruments Incorporated. Charge coupled device. 3,864,550, Cl. 235-61.11E.

Cramer, Richard L.: *See*—
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Crandall, Walter E.; Mills, George J.; and Brown, Gary G., to Northrop Corporation. Technique for forming laminated filamentary composites utilizing prestressing. 3,864,184, Cl. 156-180.000.

Crawley, James W., to California Progressive Products, Inc. Shift mechanism for derailleur drive. 3,863,512, Cl. 74-217.00B.

Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell, to Burroughs Wellcome Co. 3-Morpholino-2-cyanoacrylamide. 3,864,341, Cl. 260-247.20A.

Crewe, Peter Rowland, to British Hovercraft Corporation Limited. Flexible skirt assemblies for fluid cushion supported vehicles. 3,863,732, Cl. 180-124.000.

Criminalistics, Inc.: *See*—
Worsham, Robert; and Martin, Stephen J., 3,864,674.

Critchfield, Frank E.; and Koleske, Joseph V., to Union Carbide Corporation. Graft copolymers of Lactone Polyesters and Blends with Polyvinyl Chloride. 3,864,434, Cl. 260-899.000.

Crouch, Gordon H.: *See*—
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Cryogenic Recycling International Inc.: *See*—
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Cubic Corporation: *See*—
DeKozan, Raymond L.; Salkeld, Edwin M., Jr.; and Bush, Elsmore W., 3,864,522.
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Cuche, Claude: *See*—
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Cuda, John: *See*—
Sordello, Frank J.; and Cuda, John, 3,864,740.

Culbertson, George S.; and Karll, Robert E., to Standard Oil Company. Oil-soluble aminated oxidized olefin copolymers. 3,864,268, Cl. 252-51.50R.

Cullen, William P.; and Chafetz, Harry, to Texaco Inc. Halogenated alkenyl succinic anhydride-amine reaction. 3,864,269, Cl. 252-51.50A

Cullen, William P.; Chafetz, Harry; and Miller, Edward F., to Texaco Inc. Dehydrohalogenated Polyalkene-Maleic Anhydride Reaction. 3,864,270, Cl. 252-51.50A.

Cummings, Philip T. Wide opening collet. 3,863,940, Cl. 279-50.000.

Currah, Jack Ellwood: *See*—
Chia, Chu-jen; Currah, Jack Ellwood; and Lusby, George Russell, 3,864,374.

Cushing, Paul Richard. Supporting device. 3,863,873, Cl. 248-110.000.

Cutchaw, John M. Electrical connector. 3,864,012, Cl. 339-176.0MP.

Cutler, Hymie. Path generating system for numerical control apparatus. 3,864,613, Cl. 318-573.000.

Cutters Machine Company, Inc.: *See*—
Martin, Thomas W., Sr., 3,863,778.

Cymbalisty, Lubomyr M. O., to Canada-Cities Service, Ltd.; Atlantic Richfield Canada, Ltd.; Imperial Oil Limited; and Gulf Oil Canada, part interest to each. Treatment of middlings stream from hot water process for recovering bitumen from tar sand. 3,864,251, Cl. 210-44.000.

Dadds, Floyd S.: *See*—
Grawey, Charles E.; Untz, Robert W.; Satzler, Ronald L.; Berchtold, Jesse R.; and Dadds, Floyd S., 3,864,188.

Daenen, Robert H. C. M.: *See*—
Swett, James B.; and Daenen, Robert H. C. M., 3,863,833.

Dagiel, Richard T.; and Plough, Russell H., to Symons Corporation. Removable guard rail assembly and stanchion bracket therefor. 3,863,900, Cl. 256-59.000.

Dagiel, Richard T.: *See*—
Gregory, R. Kirk; and Dagiel, Richard T., 3,863,878.

Daikin Kogyo Co., Ltd.: *See*—
Kometani, Yutaka; Koizumi, Shun; Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; and Kondo, Kiyoichi, 3,864,298.
Tatsukami, Yoshiharu; Futami, Takashi; and Oda, Yasuhiro, 3,864,433.

Dainippon Ink and Chemicals, Incorporated: *See*—
Hisamatsu, Hiroyoshi; Takahashi, Katutoshi; Takase, Masanori; and Shiraishi, Michihiko, 3,864,133.

Dakss, Mark L.; and Zemon, Stanley A., to GTE Laboratories Incorporated. Holographic fiber to waveguide coupler. 3,864,016, Cl. 350-96.0WG.

Daktronics, Inc.: *See*—
Godes, Giles P., 3,863,872.

Dalia, Nichola, Jr. Electronic scanning switch for sonar. 3,863,724, Cl. 177-25.000.

Dalmaso, Reno. Portable, foldable rifle or gun support. 3,863,376, Cl. 42-94.000.

Daneault, Gilles: *See*—
Benko, Julius; and Daneault, Gilles, 3,864,276.

Daniele, Giuliano: *See*—
Stradella, Guiseppe; Gatti, Fernando; Daniele, Giuliano; and Strdella, Umberto, 3,863,887.

Daniels, Ben G., to Continental Can Company, Inc. Cap feeding hopper. 3,863,802, Cl. 221-68.000.

Daniels, Raymond Alex: *See*—
Buckley, Lawrence Webb; Daniels, Raymond Alex; Froula, James Dewayne; Knight, Arthur Holt; Stapleton, Dale Cliffton; and Williams, George Thomas, 3,863,603.

Danna, Patrick. Electrical circuit tester. 3,864,629, Cl. 324-72.500.

Dart Industries Inc.: *See*—
Swett, James B.; and Daenen, Robert H. C. M., 3,863,833.

Daum, Werner; Scheinpflug, Hans; Frohberger, Paul-Ernst; and Greene, Ferdinand, to Bayer Aktiengesellschaft. N-(w-cyano-alkyl)-carbamyl benzimidazoles used as insecticides, acaricides and ovicides. 3,864,490, Cl. 424-273.000.

David, Pierre Y.; and Charles, Joel M., to Etat Francais, represente par le Ministre d'Etat charge de la Defense Nationale-Delegation Ministerielle pour l'Armement-Direction Technique des Constructions. Telemetry systems employing active transponders. 3,864,662, Cl. 340-3.00R.

Davidoff, Charles. Metal-containing fibrous material. 3,864,160, Cl. 117-212.000.

Davidoff, Charles. Production of metal pattern containing fabric. 3,864,179, Cl. 156-3.000.

Davis, Anthony Roger, to Vickers Limited. Conical bearings. 3,863,997, Cl. 308-160.000.

Davis, George B., Jr. Christmas tree lighting control. 3,864,580, Cl. 307-31.000.

Davis, Martin F.; Schwanauer, Francis J.; Walenta, Ivan E.; and Walker, Gary J., to Burroughs Corporation. Read/write system for high density magnetic recording. 3,864,735, Cl. 360-51.000.

Davis, William E. Carburetor. 3,864,105, Cl. 55-259.000.

Day, Wallace; Postell, Alvin E.; and Postell, William D., to Georgia Iron Works Co. Foundry sand reducer and reclaimer. 3,863,847, Cl. 241-14.000.

Dayco Corporation: *See*—
Fisher, David G.; Krueger, Mark W.; and Bishop, Clinton L., 3,863,516.
Meadows, Roger D., 3,863,515.

De La Parra, Jose Rene Perez: *See*—
Infante-Diaz, Francisco; De La Parra, Jose Rene Perez; Gaona-Ortiz, Luis; and Gutierrez-Castaneda, Aurea, 3,863,804.

De Laval Separator Company, The: *See*—
Fuchs, Hubert K. E., 3,864,247.

Dean, Jimmie L., to Phillips Petroleum Company. Grasping parison preform at right angle to mold parting line. 3,864,445, Cl. 264-89.000.

Dean, John O. Radiator filler. 3,863,690, Cl. 141-364.000.

Deatherage, Jay W.: *See*—
Duff, Kenneth J.; and Deatherage, Jay W., 3,863,555.

Decair Helicopters, Inc.: *See*—
McWilliams, Roy J., 3,863,736.
McWilliams, Roy J., 3,863,911.

De Cerjat, Aymon; Cuche, Claude; Jeanneret, Roger, deceased (by Jeanneret, Marguerite, legal representative); Jeanneret, Pierre-Bernard, legal representative; and Zimmerman, Heinrich H. Electromagnetic selection device for the needles of a knitting machine. 3,863,465, Cl. 66-50.00R.

Deere & Company: *See*—
Hanser, Paul Edmund; and Gebauer, Thomas Edward, 3,863,722.
Muncke, Ludwig; Gross, Gerhard; and Buchmuller, Josef, 3,863,955.
Von Fummetti, Cy William; and Latham, David Dennis, 3,863,729.

DeKozan, Raymond L.; Salkeld, Edwin M., Jr.; and Bush, Elsmore W., to Cubic Corporation. Automatic telephone location system. 3,864,522, Cl. 179-5.500.

Delin, Heinz; and Voss, Werner, to H. Maihak A.G. Apparatus for determining the content of organic substances in water. 3,864,088, Cl. 23-253.0PC.

De Lisle, Robert W., to du Pont de Nemours, E. I., and Company. Substrate loader. 3,863,320, Cl. 29-203.00B.

DeLong, Vincent R.; Ludvigson, Merrill T.; Apple, Frank M.; Leeson, John L.; and Houghton, Edwin G., to Rockwell International Corporation. Frequency division multiplex telephone system. 3,864,521, Cl. 179-2.50R.

De Maria, Louis. Variable depth hair coloring applicator. 3,863,650, Cl. 132-9.000.

Den-Tal-Ez Mfg. Co.: *See—*
Swatman, Donald R., 3,863,635.

Dengler, Ludwig: *See—*
Mueller, Joachim; and Dengler, Ludwig, 3,863,602.

Dening, Daniel R., to Harris-Intertype Corporation. Deviation value generator. 3,864,560, Cl. 235-151.130.

Denning, Richard F.; and Bresnick, Stuart D., to General Atomic Corporation. Method for Reducing Hydrogen Absorption of Zirconium by Anodizing. 3,864,220, Cl. 204-37.00R.

Dennison Manufacturing Company: *See—*
Hastings, Dana B., 3,863,567.

Deordiev, Nikolai Trifonovich; Kononov, Ivan Vasilievich; Maslennikov, Ivan Egorovich; Modzheevsky, Gennady Vitalievich; Platonov, Vladimir Nikiforovich; and Sukhanov, Vasily Tikhonovich. Hydraulic press with pulsating load. 3,863,488, Cl. 72-453.000.

DePauw, Richard A., to International Harvester Company. Discharge chute and expansion chamber for an axial flow-type combine. 3,863,643, Cl. 130-27.00T.

Design Link: *See—*
Milik, Rudolf Ferdinand Leon, 3,863,904.

Desmarchais, Walter E.: *See—*
Shallenberger, John M.; Meuschke, Robert E.; and Desmarchais, Walter E., 3,863,770.

Deutsche Gold-und Silber-Scheideanstalt vormals Roessler: *See—*
Pistor, Horst; Simmersbach, Edmund, deceased; Mohler, Ingeborg, heiress; Schaller, Artur; and Knippschild, Gerd, 3,864,454.
Reinhardt, Helmut; Trebinger, Karl; and Kallrath, Gottfried, 3,864,453.

De Winter, Walter Frans: *See—*
Timmerman, Daniel Maurice; and De Winter, Walter Frans, 3,864,158.

Dey, Ervin J.: *See—*
Busch, William J.; and Dey, Ervin J., 3,863,421.

Dial, Aught Boone: *See—*
Hargett, Louie Deprez; Rose, Ellis; and Dial, Aught Boone, 3,863,586.

Diamond, Julius; and Santora, Norman J., to William H. Rorer, Inc. Substituted phenylacetic acid compounds. 3,864,384, Cl. 260-469.000.

Diamond, Julius; Douglas, George H.; and Burns, Bernard J., to William H. Rorer, Inc. 1-Substituted biguandies for treating gastrointestinal hyperacidity or ulceration. 3,864,496, Cl. 424-326.000.

Diamond Shamrock Corporation: *See—*
Beckers, Norman L., 3,864,408.
Loftfield, Richard E., 3,864,237.
Stillman, Neil W.; and Osgood, Edmond R., 3,864,361.

Diamondhead Corporation: *See—*
Gottlieb, C. Robert; and Lewis, Eugene C., 3,863,780.

Dibrell, James W., to Microwire Corporation. Augmented hydrostatic extrusion of fine wire. 3,863,481, Cl. 72-9.000.

Dico Company, Inc.: *See—*
Meads, Charles D.; and Hefler, Paul R., 3,863,971.

Dieckmann, Steffen F., to Hercules Incorporated. Esters of brominated dipentaerythritol and polymeric compositions containing same. 3,864,306, Cl. 260-45.75B.

Dierssen, Gunther H.: *See—*
Packard, James R.; Campbell, Donald A.; Tait, William C.; and Dierssen, Gunther H., 3,864,645.

Dietrich, William C.; and Manning, Delmer L., to United States of America, Atomic Energy Commission. Uranium-Sensitive Electrode Membrane. 3,864,233, Cl. 204-195.00M.

Dietrick, Gerald P. Filter system. 3,864,266, Cl. 210-329.000.

Di Giacomo, Sebastian F., to Gull Airborne Instruments, Inc. Fuel immersible capacitor for measurement of dielectric constant of liquid fuel in a tank. 3,864,609, Cl. 317-249.00R.

Dilchert, Heinz, to Dynamit Nobel Aktiengesellschaft. Solid propellant charge having a short burning time for rocket engines. 3,863,573, Cl. 102-101.000.

Dill, Hans G.: *See—*
Leupp, Alex M.; and Dill, Hans G., 3,863,332.

Dillon, Peter L. P.; and Hoesterey, Donald C., to Eastman Kodak Company. Non-impact printer. 3,864,697, Cl. 354-5.000.

Dillon, Robert F., Jr.: *See—*
United States of America, National Aeronautics and Space Administration; Dillon, Robert F., Jr.; and Mayne, Robert C., 3,863,881.

Di Martino, John M., to Line Fast Corporation. Cable tensioner. 3,863,892, Cl. 254-67.000.

Dimova, Lidia Petrovna: *See—*
Voitsekhovsky, Bogdan Vyacheslavovich; Nikolaev, Valentin Pavlovich; Shoikhet, Grigory Yankelevich; Mitin, Leonid Alexeevich; Dimova, Lidia Petrovna; and Samusenko, Vladimir Alexeevich, 3,863,989.

Dinning, Robert W., to Macco Oil Tool Company, Inc. Latching device. 3,863,961, Cl. 285-39.000.

Dinning, Robert W., to Macco Oil Tool Company, Inc. Well tool apparatus. 3,863,974, Cl. 294-86.300.

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Dollhausen, Manfred H.; and Hohmann, Gerhard, to Bayer Aktiengesellschaft. Hot adhesives. 3,864,301, Cl. 260-31.20R.

Dombro, Robert A., to Universal Oil Products Company. Alpha olefin separation process. 3,864,420, Cl. 260-677.00A.

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Steever, Andrew B.; and Kelleher, David, 3,863,577.

Dosch, Robert G.; and Prevender, Thomas S., to United States of America, Atomic Energy Commission. Process and electrolyte for applying barrier layer anodic coatings. 3,864,219, Cl. 204-33.000.

Doschko, Werner; and Gilch, Heinz. False twisting of yarn. 3,863,434, Cl. 57-157.0TS.

Dostal, Pravomil. Device for driving movable machine parts in reverse direction. 3,863,681, Cl. 139-55.000.

Dotson, Barett O. Two-wheel foldable dolly. 3,863,946, Cl. 280-36.00C.

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Doyle, Richard C., to Rucker Company, The. Electrical safety device with improved trip mechanism. 3,864,649, Cl. 335-21.000.

Dragonetti, Philip G., to United States of America, Navy. Doppler correction circuit. 3,864,634, Cl. 325-419.000.

Dremin, Gennady Timofeevich: *See—*
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Dresser Industries, Inc.: *See—*
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Grega, John M., 3,863,359.
Parker, Charles Weber, 3,863,719.

Droll, Hans. Process and apparatus for bending the ends of insulating strips in grooves or stators of electrical machines. 3,863,335, Cl. 29-596.000.

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Martin, Henry; Rohr, Otto; Duerr, Dieter; Janiak, Stefan; Pissiotas, Georg; and Toepfl, Werner, 3,864,395.

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Dumentat, Raymond E., to Speedfam Corporation. Apparatus for machining work pieces. 3,863,394, Cl. 51-109.00R.

Dunn, Edward D., Jr., to Versatile Structures, Incorporated. Void system for concrete with aggregate having projecting members. 3,863,414, Cl. 52-659.000.

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Edwards, John M.; and Wright, James D., to John Edwards and Associates, Inc. Apparatus for wrapping elongate cylindrical objects. 3,863,425, Cl. 53-211.000.

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Ekberg, Frans Hugo. Papermaking Machine Suction Box with Vibratory Movement having both Longitudinal and Vertical Components. 3,864,207, Cl. 162-365.000.

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Elders, Gerald W.; Alongi, Thomas R.; Schneider, Thomas E., deceased; and Schneider, Thomas R., administrator. Machine for driving mine roof pins having coaxial jacking means. 3,863,825, Cl. 227-130.000.

Electric Reduction Company of Canada, Ltd.: *See—*
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Elliott, Stanley B. Visual-type hygrometer. 3,863,502, Cl. 73-336.000.

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Enkvist, Terje Ulf Eugen. Kraft or soda black liquor adhesive and procedure for making the same. 3,864,291, Cl. 260-17.500.

Enomoto, Satoru, to Kureha Kagaku Kogyo Kabushika Kaisha. Water resisting and anticorrosive painting method and the painted articles. 3,864,153, Cl. 117-75.000.

Enterprise de Recherches et d'Activites Petrolieres: *See—*
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ESB Incorporated: *See—*
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Feit, Peter Werner; and Bruun, Herta, to Lovens Kemiske Fabrik Produktionsaktieselskab. New 5-Aminoisophthalic Acid Derivatives, Salts And Esters Thereof And Methods For Their Preparation. 3,864,385, Cl. 260-470.000.
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Fell, Charles Raymond. Log cabin structure. 3,863,409, Cl. 52-233.000.
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Fiorino, Benjamin C., to International Business Machines Corporation. Detection of digital data using integration techniques. 3,864,583, Cl. 307-235.00R.
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Fischbeck, Kenneth Henry, to RCA Corporation. Printing apparatus. 3,864,696, Cl. 346-140.000.
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Fitch, John L., to Mobil Oil Corporation. Method of recovering geothermal energy. 3,863,709, Cl. 165-1.000.
Flachglas Aktiengesellshaft DELOG-DETAG: *See—*
Glaser, Hans-Joachim; Graw, Gunther; and Makowicki, Karl-Heinz, 3,864,023.
Flakne, John R., to General Mills, Inc. Hot melt extrusion apparatus. 3,864,068, Cl. 425-192.000.
Flanagan, Charles D., to Texas Instruments Incorporated. Manually set magnetic relay. 3,864,651, Cl. 335-186.000.
Fleischer, Helmut; Schnaibel, Eberhard; Gotz, Werner; and Maisch, Wolfgang, to Robert Bosch G.m.b.H. Wheel braking control system. 3,863,993, Cl. 303-21.0BE.
Fleming, Philip F., to Gehl Company. Blade sharpening device for rotatable chopping cylinders including hydraulic drive means. 3,863,403, Cl. 51-249.000.
Flight Capsule, Inc.: *See—*
Bachman, Gerhart Herman, 3,863,869.
Fluet, Francis A., to Westinghouse Electric Corporation. Apparatus for digital frequency scaling. 3,864,556, Cl. 235-150.300.

Focht, John Richard, to Precision Valve Corporation. Variable flow rate actuator button for a pressurized aerosol dispenser. 3,863,816, Cl. 222-402.170.

Foley, Patrick Joseph, Jr., to du Pont de Nemours, E. I., and Company. Flame resistant polyamides. 3,864,302, Cl. 260-37.00N.

Folkman, M. Judah. Method for measurement of oxygen content in blood and other liquids by oxygen inhibition of chemical reactions. 3,864,084, Cl. 23-230.00R.

Forbes, Ronald G.; and Turjanica, Michael, to General Electric Company. Process for reclaiming rare-earth phosphors. 3,864,273, Cl. 252-301.40R.

Ford, Charles R.: *See—*
Gatsos, Stephen L.; Abercrombie, Roy F.; and Ford, Charles R., 3,863,521.

Ford Industries, Inc.: *See—*
Owen, James, 3,864,519.
Owen, James, 3,864,520.

Forschner, Robert H.; and Kushner, Robert J., to Aluminum Company of America. Method for forming holes. 3,863,531, Cl. 83-54.000.

Forsyth, Brian R.; and Rand, Corey D. Electrical crossword puzzle. 3,863,931, Cl. 273-156.000.

Foseco International Limited: *See—*
Eccleston, Kenneth Thomas; and Fieldhouse, Roger, 3,863,308.

Foss, Arthur J., to Victor Comptometer Corporation. Function Control Key Locks. 3,863,475, Cl. 70-360.000.

Foster, Kenneth William Samuel; Wallace, Neil McIntosh; and Irons, Duncan Kinloch, to Renold Limited. Hydraulic motors and driving systems employing same. 3,863,447, Cl. 60-425.000.

Foulke, Richard F.; and Kelly, James E., to Mech-El Industries, Inc. Tailless wire bonder. 3,863,827, Cl. 228-5.000.

Fowler, Larry G., to Sugar Cane Growers Cooperative of Florida. Apparatus for harvesting and cleaning windrowed cane. 3,863,431, Cl. 56-502.000.

Fowler, Wyland L.: *See—*
Perry, Donald S.; Fowler, Wyland L.; Shattuck, Richard E.; and Mueller, Hans W., 3,863,749.

Fox, D. Marshall; and Weiss, Richard B., to Aluminum Company of America. Electrical conductor. 3,864,507, Cl. 174-14.00R.

Fox, D. Marshall: *See—*
Weiss, Richard B.; and Fox, D. Marshall, 3,863,969

Foxboro Company, The: *See—*
Olsen, Everett O., 3,864,614.

Franchi, Vicenzo, to Franchi Wood Mosaic Company Limited. Marine decking. 3,863,417, Cl. 52-741.000.

Franchi Wood Mosaic Company Limited: *See—*
Franchi, Vicenzo, 3,863,417.

Frank, Eldon M. Implement device and method of mounting same on tractor. 3,863,786, Cl. 214-131.00A.

Franz, Fred A.: *See—*
Fisher, Glen W.; and Franz, Fred A., 3,863,811.

Franz Kuhlmann KG: *See—*
Bottcher, Albert; and Maass, Hans, 3,863,5[illegible].

Franz, Maurice F.: *See—*
Moline, Kenneth R.; Franz, Maurice F.; and Webber, Philip S., 3,863,520.

Franz, William F.; Hess, Howard V.; Cole, Edward L.; and Neisser, Kenneth E., to Texaco Inc. Integrated process for coking spent base sulfite pulping liquors. 3,864,205, Cl. 162-31.000.

Franz, William F.: *See—*
Hess, Howard V.; Franz, William F.; and Cole, Edward L., 3,864,254.

Fraser, Myron B. Security device for a door. 3,863,968, Cl. 292-260.000.

Frederick, Arthur F., to United States of America, Navy. Suction fastening device. 3,863,568, Cl. 102-13.000.

Frederiksen, Erling Knud; and Godtfredsen, Wagn Ole, to Lovens Kemiske Fabrik Produktionsaktieselskab. Acyloxymethyl esters of α-aminopenicillins. 3,864,331, Cl. 260-239.100.

Freeman, Percy F. Bale shredder and discharger. 3,863,850, Cl. 241-186.00R.

Freudenberger, Dieter: *See—*
Fernholz, Hans; and Freudenberger, Dieter, 3,864,383.

Fridinger, Tomas L.; Mutsch, Edward L.; and Pauly, David R., to Minnesota Mining and Manufacturing Company. 2,6-Dihalobenzaldehyde Sulfonyl Hydrazones. 3,864,397, Cl. 260-556.00H.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Seelig, Henri R.; and Von Waclawiczek, Ritter, 3,864,122

Friedrich Deckel Aktiengesellschaft: *See—*
Reeber, Rudolf; Hofmeister, Peter; Strobl, Heinrich; and Muller, Johann, deceased, 3,863,544.

Friend, Lindsay C., to du Pont de Nemours, E. I., and Company. Circuit board socket. 3,864,004, Cl. 339-258.00R.

Frierson, William; and Oberwager, Jerome, to National Teaching Aids, Inc. Elastic sheet having the appearance of stained glass. 3,864,193, Cl. 161-2.000.

Fries, Carl E., Jr.: *See—*
Homberg, Otto A.; and Fries, Carl E., Jr., 3,864,378.

Frohberger, Paul-Ernst: *See—*
Daum, Werner; Scheinpflug, Hans; Frohberger, Paul-Ernst; and Greene, Ferdinand, 3,864,490.

Froula, James Dewayne: *See—*
Buckley, Lawrence Webb; Daniels, Raymond Alex; Froula, James Dewayne; Knight, Arthur Holt; Stapleton, Dale Cliffton; and Williams, George Thomas, 3,863,603.

Fry, Jeremy Joseph, to Rotork Limited. Cam operated clutches with automatic lock. 3,863,745, Cl. 192-93.00R.

Fryer, Rodney Ian; and Walser, Armin, to Hoffmann-La Roche Inc. 2-Hydrazino benzodiazepine derivatives. 3,864,328, Cl. 260-239.0BD.

Fuchs, Hubert K. E., to De Laval Separator Company, The. Biological decomposition of organic material by thermophilic microorganisms. 3,864,247, Cl. 210-12.000.

Fugi Photo Film Co., Ltd.: *See—*
Arai, Takuya, 3,863,762.

Fuji Electric Company Limited: *See—*
Kawamoto, Nobuhiko; Nakajima, Tositaka; and Okubo, Tomoyuki, 3,864,610.

Fuji Photo Film Co., Ltd.: *See—*
Kato, Hisatoyo, 3,864,082.
Miyatuka, Hajime, 3,864,127.
Tanaka, Mitsugu; Hayashi, Katsumi; and Arai, Atsuaki, 3,864,131.
Ueda, Hirozo; Shiba, Keisuke; and Sato, Akira, 3,864,134.

Fujimori, Masao, to Taiheiyo Coal Mining Co., Ltd. Mining shield-supporing carrier. 3,863,793, Cl. 214-518.000.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Nagao, Minoru; Iwata, Takashi; Yagi, Hideo; Tamura, Saburo; Haruta, Hisae; and Nakanishi, Kazuo, 3,864,349.

Fujitsu Limited: *See—*
Inaba, Seiuemon, 3,864,588.

Fukai, Masakazu: *See—*
Moriyama, Akio; Fukai, Masakazu; and Asai, Komei, 3,864,022.

Fukazawa, Nobuo: *See—*
Kudamatsu, Akio; Miyamoto, Masao; and Fukazawa, Nobuo, 3,863,474.

Fukuda, Takeo; Torii, Kenichi; and Nishibayashi, Kazuo, to Tokyo Shibaura Electric Co., Ltd. Local oscillation device for a television receiver set. 3,864,636, Cl. 325-421.000.

Fuller, Richard Buckminster. Floatable breakwater. 3,863,455, Cl. 61-5.000.

Furukawa, Yasuyoshi: *See—*
Kometani, Yutaka; Koizumi, Shun; Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; and Kondo, Kiyoichi, 3,864,298.

Furuuchi, Shigemasa; Ohta, Hironiri; Sugaya, Koichi; and Kamimori, Tadatoshi, to Asahi Glass Company, Ltd. Humidity sensor. 3,864,659, Cl. 338-35.000.

Futami, Takashi: *See—*
Tatsukami, Yoshiharu; Futami, Takashi; and Oda, Yasuhiro, 3,864,433.

Futty, Robert C.: *See—*
Kugle, John L.; and Futty, Robert C., 3,863,849.

G. Siempelkamp & Co.: *See—*
Gerhardt, Klaus, 3,863,361.
Gerhardt, Klaus, 3,864,066.

Gabriel, Frank K.; and Leshnoff, Stephen D., to Westinghouse Electric Corporation. Cooled turbine blade ring assembly. 3,864,056, Cl. 415-178.000.

Gagnon, Paul Emile. Waist tethered ball & target. 3,863,924, Cl. 273-97.00R.

Galen Laboratories, Inc.: *See—*
Markley, Finley W., 3,864,265.

Galleithner, Hans; and Strauch, Kurt, to Semperit Aktiengesellschaft. Building of pneumatic tire assemblies. 3,864,189, Cl. 156-415.000.

Gallup, Leslie E. Method for providing cooled aerated water. 3,863,605, Cl. 119-3.000.

Gannaway, Edwin L., to Sundstrand Corporation. Suction muffler tube for compressor. 3,864,064, Cl. 417-312.000.

Gante, Joachim; and Schneider, Gerhart, to Merck Patent Gesellschaft mit beschrankter Haftung. Herbicidal agents. 3,864,117, Cl. 71-115.000.

Gaona-Ortiz, Luis: *See—*
Infante-Diaz, Francisco; De La Parra, Jose Rene Perez; Gaona-Ortiz, Luis; and Gutierrez-Castaneda, Aurea, 3,863,804.

Gardner, Charles V.: *See—*
Millar, James S.; and Gardner, Charles V., 3,863,688.

Gardner, David Michael: *See—*
MacDonald, Frank; Gardner, David Michael; and Stephens, Roy, 3,863,485.

Gardner, Lloyd E., to Phillips Petroleum Company. Ruthenium-promoted fluorided alumina as a support for SbF_5-HF in paraffin isomerization. 3,864,425, Cl. 260-683.680.

Garrett Corporation, The: *See—*
Womack, William C., 3,864,058.

Garwood, William Guy. Bicycle security rack. 3,863,767, Cl. 211-5.000.

Gates, Paul E.: *See—*
Kimball, Stephen F.; and Gates, Paul E., 3,863,313.

Gatsos, Stephen L.; Abercrombie, Roy F.; and Ford, Charles R., to Carlisle Corporation. Adjustable handlebars. 3,863,521, Cl. 74-551.400.

Gatti, Fernando: *See—*
Stradella, Guiseppe; Gatti, Fernando; Daniele, Giuliano; and Strdella, Umberto, 3,863,887.

Gaubert, Rene J. Film unwinding and splicing apparatus and method. 3,863,855, Cl. 242-58.400.

Gawthrop, Theo C. Boat trailer backup guide. 3,863,594, Cl. 116-28.00R.

Gay, Derek J.; and Smedley, William H., to Mattel, Inc. Changeable music box toy. 3,863,539, Cl. 84-94.000.

Gaylord, Norman G., to Gaylord Research Institute, Inc. Method for preparing alternating copolymers using a friedel-crafts catalyst and a free radical initiator in an aqueous medium. 3,864,319, Cl. 260-82.300.

Gaylord Research Institute, Inc.: *See—*
Gaylord, Norman G., 3,864,319.

Gazza, George E.; and Lindley, Michael W., to United States of America, Army, by said Gazza; and Secretary of State for Defence Ministry of Defence, The, by said Lindley. Ceramic-metal systems by infiltration. 3,864,154, Cl. 29-123.00B.

Gealy, William E.; and Vrendenburgh, Walter A., to Hercules Incorporated. Inhibiting color change in solutions of vinylaromatic resins in chlorinated solvents. 3,864,078, Cl. 8-142.000.

Gebauer, Thomas Edward: *See—*
Hanser, Paul Edmund; and Gebauer, Thomas Edward, 3,863,722.

Gebr. Boehler & Co. AG: *See—*
Hanisch, Harald, 3,864,210.

Gee, James E.; and Stedman, Robert N., to Caterpillar Tractor Company. Auger scraper with recessed ejector. 3,863,367, Cl. 37-8.000.

Gehl Company: *See—*
Fleming, Philip F., 3,863,403.

Gehrke, Gerard William: *See—*
Elmore, J. Russell; and Gehrke, Gerard William, 3,863,742.

Gehrmann, Klaus: *See—*
Ohorodnik, Alexander; Gehrmann, Klaus; Hundeck, Joachim; and Vierling, Hermann, 3,864,281.

Geiss, Johannes; and Eberhardt, Peter, to OMEGA Louis Brandt & Frere S.A. Method for stabilizing the temperature of an instrument, particularly of a wrist watch. 3,863,707, Cl. 165-1.000.

Geist, Kenneth R.; and Walsh, James E., to said Brust, by said Geist, a part interest. Apparatus for measuring gaseous quality of a substance. 3,864,086, Cl. 23-253.00R.

Geldmacher, Jurgen: *See—*
Nassenstein, Heinrich; and Geldmacher, Jurgen, 3,864,130.

Gellert, Gabor: *See—*
Finkelstein, Laurence Stephen; and Gellert, Gabor, 3,863,876.

Gendron, Wilfred H., to United States Envelope Company. Letter packages. 3,863,835, Cl. 229-69.000.

General Atomic Corporation: *See—*
Denning, Richard F.; and Bresnick, Stuart D., 3,864,220.

General Battery Corporation: *See—*
Toback, Henry, 3,863,775.

General Cable Corporation: *See—*
Leonardo, Ignazio, 3,863,307.

General Electric Company: *See—*
Cardwell, John G., Jr., 3,864,598.
Conlon, Bartholomew F., Jr., 3,863,856.
Forbes, Ronald G.; and Turjanica, Michael, 3,864,273.
Ham, Donald M., 3,864,630.
Horvay, Julius B.; and Powell, John M., 3,863,391.
Klein, Keith William, 3,864,005.
Morby, John Alfred; Rich, Joseph Francis; and Grade, George Henry, Jr., 3,864,511.
Pitha, John J.; and Ellis, Howard F., 3,864,658.
Watrous, Donald L., 3,864,606.
Wiener, Leonard Stern, 3,863,612.
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General Foods Corporation: *See—*
Biscardi, Salvatore F., 3,864,489.

General Mills Chemicals, Inc.: *See—*
Modler, Robert F.; and Harrison, Stuart A., 3,864,314.

General Mills, Inc.: *See—*
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Kinne, Lewis K., 3,863,369.

General Motors Corporation: *See—*
Bright, James A., 3,863,461.
Hause, Gilbert K., 3,863,450.
Meginnis, George B., 3,864,199.
Mentessi, Roland A., 3,863,986.
Plyler, Robert G.; and Russo, Andrew, Jr., 3,864,007.
Schaefer, Robert H.; and Lentz, Carl A., 3,863,739.

General Refractories Company: *See—*
Farrington, Grant M., Jr.; and Staut, Ronald, 3,864,136.

General Science Corporation: *See—*
Oefinger, Arthur, 3,864,551.

George Kent Limited: *See—*
Musgrave, Gerald; and Hayes, Alan Michael, 3,864,639.

Georgia Iron Works Co.: *See—*
Day, Wallace; Postell, Alvin E.; and Postell, William D., 3,863,847.

Gerecht, John Fred, to Colgate-Palmolive Company. Sunscreening compositions containing sulfonium salts. 3,864,474, Cl. 424-60.000.

Gerhardt, Klaus, to G. Siempelkamp & Co. Method and apparatus for drying a gypsum board or the like. 3,863,361, Cl. 34-191.000.

Gerhardt, Klaus, to G. Siempelkamp & Co. Apparatus for spreading comminuted partly cementitious material on a moving support. 3,864,066, Cl. 425-84.00C.

Gerhardt, Peter: *See—*
Seiler, Claus-Dietrich; Vahlensieck, Hans-Joachim; and Gerhardt, Peter, 3,864,373.

Gerlach, Klaus: *See—*
Staffe, Adolf; and Gerlach, Klaus, 3,864,396.

Gerlach, Kurt: *See—*
Wilhelm, Jurgen; Gerlach, Kurt; and Mahnau, Heinrich, 3,864,574.

Gesellschaft fur Kermforschung mbH: *See—*
Wilhelm, Jurgen; Gerlach, Kurt; and Mahnau, Heinrich, 3,864,574.

Geute, Harvey J.: *See—*
Moomey, Henry, 3,863,413.

Giannotti, Hugo V., to Ski Dynamics Inc. Ski anti-crossing device. 3,863,943, Cl. 280-11.37E.

Giatti, Filippo, to AMF Incorporated. Device for forming pairs of axially aligned cigarettes with an interposed double filter. 3,863,750, Cl. 198-20.00C.

Gibson, John; and Nelson, James. Chain tensioning devices and drive assemblies for mining. 3,863,522, Cl. 74-661.000.

Gidon Industries, Inc.: *See—*
Wright, Peter C.; and Kirsch, Donald L., 3,863,483.

Gilbreth Company: *See—*
Spiegel, Jacob; and Miller, Albert (said Miller assors. to), 3,863,837.

Gilch, Heinz: *See—*
Doschko, Werner; and Gilch, Heinz, 3,863,434.

Gillespie, Herman L. Loop device for mounting on boat. 3,863,588, Cl. 114-218.000.

Gillespie, Peter James: *See—*
Mills, Terence; Wiacek, Marian; Gillespie, Peter James; and Hatcher, Clive Douglas, 3,864,171.

Gillette Company, The: *See—*
Perry, Roger L., 3,863,340.
Wellinger, Roger Paul; Vauthier, Francis Andre; and Botta, Alberto, 3,863,338.

Gilli, Paul Viktor: *See—*
Beckmann, Georg; Gilli, Paul Viktor; and Lippitsch, Josef, 3,863,711.

Gillings, Peter Richard, Jr. Knee-chair. 3,863,978, Cl. 296-63.000.

Gillis, Robert E. Shelter structure. 3,863,659, Cl. 135-4.00R.

Gilmore-Tatge Manufacturing Co., Inc.: *See—*
Chaffee, Robert C.; and Toburen, Delmar, 3,863,815.

Giocoechea, George, to Respiratory Care, Inc. Humidifier and heater for delivered gas. 3,864,440, Cl. 261-122.000.

Girling Limited: *See—*
Kinman, George, 3,863,740.

Gish, David B., to Bell & Howell Company. Pulse-code modulation detector and equalizer. 3,864,734, Cl. 360-41.000.

Giunia, Joseph S.: *See—*
Bengel, Thomas G.; Giunia, Joseph S.; and Nicely, Thomas E., 3,863,356.

Givaudan Corporation: *See—*
Bozzato, Giuliano; and Pesaro, Mario, 3,864,285.

Giwosky, Harry L., to Jordan Controls, Inc. Fluid positioning apparatus. 3,863,446, Cl. 60-388.000.

GKN Transmissions Limited: *See—*
Pagdin, Brian Colin, 3,863,615.

Glabiszewski, Richard, to Otto Boch Orthopadische Industries KG. Articulate joint for prosthetic devices. 3,863,274, Cl. 3-27.000.

Glacier Metal Company, The: *See—*
MacDonald, Frank; Gardner, David Michael; and Stephens, Roy, 3,863,485.

Glaeser, Werner T. Method and apparatus for controlling sunlight transmission. 3,863,660, Cl. 135-20.00R.

Glaser, Hans-Joachim; Graw, Gunther; and Makowicki, Karl-Heinz, to Flachglas Aktiengesellshaft DELOG-DETAG. Electro-optical display device. 3,864,023, Cl. 350-160.0LC.

Glasner, Thomas C.: *See—*
Rolker, John H.; and Glasner, Thomas C., 3,864,320.

Glatzel, Erhard, to Carl Zeiss Stiftung (a.k.a. Carl Ziess). Wide angle photographic lens. 3,864,026, Cl. 350-214.000.

Glickstein, Joseph: *See—*
Ishida, Takanobu; Popowicz, Anthony M.; and Glickstein, Joseph, 3,863,669.

Goddard, Norman H., to JCN Wire Industries Ltd.; and JCN Wire Industries Ltd. Structural members for providing releasable connections and structures incorporating the members. 3,863,769, Cl. 211-182.000.

Godes, Giles P., to Daktronics, Inc. Readout panel. 3,863,872, Cl. 248-27.000.

Godfrey, Charles S., to Physics International Company. Hole drill and debris clearance method and means. 3,863,723, Cl. 175-4.500.

Godin, Thomas J.: *See—*
Jones, Alan Richardson; and Godin, Thomas J., 3,863,507.

Godtfredsen, Wagn Ole: *See—*
Frederiksen, Erling Knud; and Godtfredsen, Wagn Ole, 3,864,331.

Goett, Joseph E.: *See—*
Webber, Philip S.; and Goett, Joseph E., 3,863,518.

Goff, James R., to Nelson, Robert J. Apparatus for supporting work means on vertically disposed surface. 3,863,393, Cl. 51-9.000.

Gohrbandt, Wilhelm: *See—*
Popp, Gottfried; Haebler, Wolfgang; and Gohrbandt, Wilhelm, 3,864,077.

Gold, Nicholas, to Polaroid Corporation. Photographic apparatus. 3,864,703, Cl. 354-86.000.

Goldman, Leon: *See—*
Marsico, Joseph William, Jr.; Joseph, Joseph Peter; and Goldman, Leon, 3,864,359.

Goldsberry, Fred L., to Lone Star Gas Company. Refrigerant expander compressor. 3,864,065, Cl. 417-406.000.

Goltz, Kurt; and Blum, William Adrian, to Pennwalt Corporation Chromate rinse for phosphate coated metals and metal products. 3,864,175, Cl. 148-6.200.

Gommans, Hubertus Johannes Josephus, to U.S. Philips Corporation. Coaxial cable whose dielectric partly consists of air. 3,864,509, Cl. 174-28.000.

Good, Lawrence R.: *See—*
Waters, Frank J.; and Good, Lawrence R., 3,863,668.

Goodwin, Edwin C., Jr.; Holden, Lynne A.; and Meinders, Gerardus J., to Allis-Chalmers Corporation. Modular gas insulated circuit breaker system. 3,864,534, Cl. 200-148.00R.

Gordon, Gilbert W.: *See—*
Hallerberg, William L.; and Gordon, Gilbert W., 3,863,702.

Gordon, Robert L.; and Siegele, John C., to International Paper Company. Food container. 3,863,832, Cl. 229-30.000.

Gorling, Karl Goran: *See—*
Jensfelt, Torsten Eli; and Gorling, Karl Goran, 3,864,121.

Gosling, Samuel, to Scrogg Ernest Sons Limited. Yarn Heater. 3,864,074, Cl. 432-59.000.

Gottlieb, C. Robert; and Lewis, Eugene C., to Diamondhead Corporation. System for placing factory prefabricated housing units. 3,863,780, Cl. 214-38.0CA.

Gottlieb, Carl R.; and Fathauer, Jack E., to Midland-Ross Corporation. Fork truck spreader for cargo containers. 3,863,970, Cl. 294-67.0DA.

Gottsegen, Agnes: *See—*
Feuer, Laszlo; Nogradi, Mihaly; Gottsegen, Agnes; Vermes, Borbala; Streliszky, Janos; Wolfner, Andras; Farkas, Lorant; Antus, Sandor; Kovacs, Maria; and Toth, Nee, 3,864,362.

Gotz, Werner: *See—*
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Graco Inc.: *See—*
Kozinski, David A.; Siczek, Bernard W.; and Carlson, Kenneth L., 3,864,603.

Grade, George Henry, Jr.: *See—*
Morby, John Alfred; Rich, Joseph Francis; and Grade, George Henry, Jr., 3,864,511.

Graham, Roy R., to PPG Industries, Inc. Glass fiber size and resulting product. 3,864,155, Cl. 117-126.0GB.

Gram, Hans. Vacuum curettage device. 3,863,624, Cl. 128-2.00B.

Granger, Alain; Lissot, Jean; and Sausse, Andre, to Rhone-Poulenc S.A. Pressure modulator for an artificial blood circuit. 3,864,248, Cl. 210-19.000.

Graw, Gunther: *See—*
Glaser, Hans-Joachim; Graw, Gunther; and Makowicki, Karl-Heinz, 3,864,023.

Grawey, Charles E.; Untz, Robert W.; Satzler, Ronald L.; Berchtold, Jesse R.; and Dadds, Floyd S., to Caterpillar Tractor Company. Tire Wrapping Machine. 3,864,188, Cl. 156-397.000.

Gray, Eric G. Anti-blinding wiper assembly for vibratory separator. 3,863,765, Cl. 209-323.000.

Grazen, Frank S.; Buike, Melvin L.; and Bryzinsky, Frank M., to Hooker Chemicals & Plastics Corporation. Friction particle for brake lining. 3,864,304, Cl. 260-38.000.

Green, Norman W.; and Dunning, Richard W. Carbon Detection. 3,864,083, Cl. 23-230.0PC.

Green, William Edward. Soil treatment. 3,864,114, Cl. 71-3.000.

Greene, Ferdinand: *See—*
Daum, Werner; Scheinpflug, Hans; Frohberger, Paul-Ernst; and Greene, Ferdinand, 3,864,490.

Grega, John M., to Dresser Industries, Inc. Refractory gas distributor for a fluidized solids reactor. 3,863,359, Cl. 34-57.00R.

Gregg, Rodman I., to Hercules Incorporated. Method for scouring and blooming pile carpet. 3,864,079, Cl. 8-151.000.

Gregory, R. Kirk, to Symons Corporation. Traction head for a column-mounted shoring bracket. 3,863,877, Cl. 248-295.000.

Gregory, R. Kirk; and Dagiel, Richard T., to Symons Corporation. Column-mounted shoring bracket assembly for overhead formwork. 3,863,878, Cl. 248-295.000.

Gresham Infomaq Ltd.: *See—*
Becker, Robert Sidney; Painter, Eric Frank; and Rickard, Gerrard Charles, 3,864,753.

Grewe, Ronald E.; and Hoersten, Eugene L., to Huffman Manufacturing Company, The. Wheel ramp. 3,863,895, Cl. 254-88.000.

Griffies, David R.; Robison, Russell O.; and Taylor, Robert W., to Rockwell International Corporation. Saber saw. 3,863,342, Cl. 30-393.000.

Grimes; executrix, Mary E.: *See—*
Grimes, George R., deceased, 3,863,708.

Grimes, George R., deceased (by Grimes; executrix, Mary E.), to Amax Inc. Modulatable heat exchanger with restraint to avoid condensation. 3,863,708, Cl. 165-1.000.

Grindley, Robert M.; and Strong, Michael J., to International Audio-Visual Hong Kong Ltd. Tape duplicating device. 3,864,732, Cl. 360-15.000.

Grindstaff, Donald A.; and Ahern, William P., to Stauffer Chemical Company. Process For Pretreating Raw Cheese Whey. 3,864,506, Cl. 426-356.000.

Grinshpon, Semen Yakovlevich: *See—*
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Hanser, Paul Edmund; and Gebauer, Thomas Edward, to Deere & Company. Motor grader blade-shifting hydraulic actuator and mount therefor. 3,863,722, Cl. 172-795.000.
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Haubner, George; Hofer, Walter; and Schmaldienst, Peter, to Robert Bosch G.m.b.H. Transistorized control circuit for magneto motor ignition systems. 3,864,622, Cl. 322-17.000.
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Kaercher, Ralph William; and Pierce, Stanley Wiswell, deceased (by Pierce, Martha Murphy, executrix), to American Can Company. Labeled side-seamed can body. 3,863,373, Cl. 40-306.000.

Kahan, Steven J. Game utilizing a plurality of tiles. 3,863,929, Cl. 273-137.00C.

Kahler, Charles: *See—*
Souslin, Richard Ervin; Klansnic, James E.; and Kahler, Charles, 3,863,867.

Kahler, Richard W., to Surf and Psych, Inc. Smoking device. 3,863,646, Cl. 131-173.000.

Kahn, Freidhelm. Method of casting by pouring metal from a melt supply through a feeder into a mold. 3,863,704, Cl. 164-130.000.

Kaiser Aluminum & Chemical Corporation: *See—*
Springer, Willard J.; and Baker, Bruce A., Jr., 3,864,230.

Kajitani, Tadahiro. Cake stock dispensing apparatus. 3,864,067, Cl. 425-166.000.

Kakihara, Minoru, to Mitsui Shipbuilding and Engineering Co., Ltd. Lubricating oil supplying apparatus for stern tube bearing. 3,863,737, Cl. 308-122.000.

Kalen, Stuart E., to Cogsdill Tool Products, Inc. Gauge for checking radius and spherical surface. 3,863,351, Cl. 33-169.00R.

Kalfaian, Meguer V. Signal conversion apparatus. 3,864,518, Cl. 179-1.0SA.

Kallrath, Gottfried: *See—*
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Kalnin, Ilmar L.: *See—*
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Kameoka, Akio; Kuriyagawa, Mamoru; and Nakamura, Shinichi, to Tokyo Shibaura Electric Co., Ltd. Four-Channel Stereophonic Sound Reproducing System. 3,864,516, Cl. 179-1.0GQ.

Kamimori, Tadatoshi: *See—*
Furuuchi, Shigemasa; Ohta, Hironiri; Sugaya, Koichi; and Kamimori, Tadatoshi, 3,864,659.

Kan, Masao; Hyodo, Hiroshi; Matsuoka, Hirofusa; Watanabe, Akio; and Enami, Shigekazu, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Process for enveloping fine drops of dispersed liquids. 3,864,275, Cl. 252-316.000.

Kanai, Hiroyuki. Ballon Control Ring. 3,863,433, Cl. 57-106.000.

Kanarek, Joseph S. Wrapper removal apparatus. 3,863,790, Cl. 214-305.000.

Kanebo Kabushiki Kaisha: *See—*
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Kaneko, Yasuhisa: *See—*
Niimi, Itaru; Kaneko, Yasuhisa; Morita, Akiyoshi; Yagi, Katumi; and Kashiwagi, Hiromitu, 3,863,701.

Kang, Pierson S.: *See—*
Sarka, Albert J.; and Kang, Pierson S., 3,863,550.

Kanow, Willy, to Loew Opta GmbH. Frequency regulation of voltage controlled oscillators using clock-driven digital counters. 3,864,637, Cl. 325-470.000.

Kantarian, Edward T.: *See—*
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Karl, Robert D.; Stearns, Thomas D.; and Engh, Ian B., to Imodco, Inc. Automatic mooring system. 3,863,590, Cl. 114-230.000.

Karll, Robert E.: *See—*
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Karls, Robert F., to Emerson Electric Co. Compactor. 3,863,561, Cl. 100-53.000.

Karppinen, Toivo Johannes. Mirror sight for small firearms. 3,863,354, Cl. 33-233.000.

Kasai, Kazutomo; and Koizumi, Shuzo, to Kabushiki Kaisha Suwa Seikosha. Macrocystalline watch dial. 3,863,439, Cl. 58-127.00R.

Kasano, Kazuhiko, to Ise Electronics Corporation. Flat fluorescent letter display tubes. 3,864,593, Cl. 313-514.000.

Kashiwagi, Hiromitu: *See—*
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Katagiri, Yoshio; and Miyata, Yoshio, to Kabushiki Kaisha Daini Seikosha; and Kabushiki Kaisha Seikosha. Liquid crystal display device and method for processing the surface of electrode glass thereof. 3,864,021, Cl. 350-160.0LC.

Kato, Hisamitsu; Yoshimura, Masashi; Takei, Yoshitaka; Nishina, Akio; and Yamashita, Ryosuke, to Hitachi Shipbuilding and Engineering Co., Ltd. Incinerator stoker. 3,863,578, Cl. 110-8.00R.

Kato, Hisatoyo, to Fuji Photo Film Co., Ltd. Method of continuously measuring the progress of development of photographic emulsions. 3,864,082, Cl. 23-230.00R.

Kato, Masao; Hasegawa, Masaki; and Ichijyo, Taro, to Agency of Industrial Science & Technology. Novel photosensitive polymer. 3,864,308, Cl. 260-47.0UA.

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Katoh, Hiroshi, to Victor Company of Japan, Ltd. Automatic tape loading mechanism for a recording and/or reproducing apparatus. 3,864,742, Cl. 360-85.000.

Katsube, Junki; Takashima, Yoshinori; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Akatsu, Mitsuhiro; Mori, Kazuo; Katsuki, Isao; Kume, Yoshiharu; Sato, Hiromi; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Benzodiazepine derivatives and production thereof. 3,864,330, Cl. 260-239.30D.

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Kaufmann, Hans. Shortening hook. 3,863,441, Cl. 59-93.000.
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Kawamoto, Nobuhiko; Nakajima, Tositaka; and Okubo, Tomoyuki, to Fuji Electric Company Limited. Speed control device for brushless dc motor. 3,864,610, Cl. 318-317.00u.
Kawasaki, Hironori: *See*—
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Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Light amount integration means. 3,864,565, Cl. 250-214.00P.
Kawasaki, Muneo: *See*—
Harada, Toshio; Nakamata, Shinichi; Araki, Shiro; Nakashima, Koei; Kawasaki, Hironori; Watanabe, Kazuo; Kawasaki, Muneo; and Niino, Shuhei, 3,863,478.
Keeler, Eugene R., to Timex Corporation. Mosfet dynamic circuit. 3,864,582, Cl. 307-225.00C.
Keith, Horace J. Reel support and winder apparatus. 3,863,859, Cl. 242-77.000.
Keldany, Rachid, to Ruti Machinery Works Ltd., (formerly Caspar Honegger). Nozzle device for producing a fluid jet. 3,863,822, Cl. 226-97.000.
Kelleher, David: *See*—
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Keller, Douglas V., Jr.; and Smith, Clay D., to Chemical Comminutions International, Inc. Application for the benefaction of coal utilizing high volatile liquids as chemical comminutants. 3,863,846, Cl. 241-1.000.
Keller-Volper, Ernst. Espagnolette lock. 3,863,471, Cl. 70-116.000.
Kellermann, Reiner. Method for testing a multiplex transmission system. 3,864,523, Cl. 179-15.0BF.
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Khan, Shahid R., to Scott & Fetzer Company, The. Shock absorbing bumper and hitch. 3,863,956, Cl. 280-483.000.
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Kile, Glenn F., to Phillips Petroleum Company. Furan purification. 3,864,363, Cl. 260-346.10R.
Kimball, Stephen F.; and Gates, Paul E., to GTE Sylvania Incorporated. Manufacture of subminiature incandescent lamps. 3,863,313, Cl. 29-25.150.
Kimberly-Clark Corporation: *See*—
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Kinberg, Benjamin, to Horsman Dolls Inc. Readily erasable doll face assembly. 3,863,386, Cl. 46-135.00R.
King, Bruce, to King Scientific Limited. Educational/navigational device. 3,863,364, Cl. 35-43.000.
King, Charles M.; and Musser, Michael T., to du Pont de Nemours, E. I., and Company. Hydrocyanation of Olefins. 3,864,380, Cl. 260-465.80R.
King, Jack C., to Shaw-Walker Company, The. Self laminated hanging file folder. 3,863,828, Cl. 229-1.50R.
King, Lloyd L.; and Marshall, Robert K., to Exxon Nuclear Company, Inc. Removable upper tie plate. 3,864,211, Cl. 176-78.000.
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Kinman, George, to Girling Limited. Seal for hydraulic damper. 3,863,740, Cl. 188-322.000.
Kinne, Lewis K., to General Mills, Inc. Label. 3,863,369, Cl. 40-2.00R.
Kinney, Alfred W., to Phillips Petroleum Company. Method and apparatus for orienting elements having a concave portion. 3,863,757, Cl. 198-271.000.
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Kitai, Kiyoshi; Onda, Eiichi; Koyama, Mitsuo; and Nakagawa, Tadashi, to Seiko Koki Kabushiki Kaisha. Focal plane shutter blade support device. 3,864,713, Cl. 354-246.000.
Kitamura, Shigeyoshi; Okuno, Yositosi; and Hirano, Masachika, to Sumitomo Chemical Company, Limited. Alkynyl esters of α-alkoxy-α-phenyl alkenoic acid. 3,864,388, Cl. 260-473.00A.
Kitamura, Shuji; and Horikoshi, Kimio, to Sumitomo Chemical Company, Limited. Coated glass bottle. 3,864,152, Cl. 117-73.000.
Kitano, Kyozo; Nakayama, Junichi; and Toyoda, Sadao, to Lion Fat & Oil Co., Ltd. Thin-film type sulfonation process. 3,864,375, Cl. 260-459.000.
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Klass, Donald L.; and Landahl, Carl D., to Institute of Gas Technology. Selective solid-state gas sensors and method. 3,864,628, Cl. 324-71.0SN.
Kleaveland, Richard N. Disposable visceral retainer. 3,863,639, Cl. 128-303.00R.
Klein, Edward I., to V-Mark Automation Ltd. Apparatus and process for article filling under reduced pressure. 3,863,686, Cl. 141-20.500.
Klein, Keith William, to General Electric Company. Resilient electrical terminal connector. 3,864,005, Cl. 339-272.00R.
Klein, Samuel, to Leather Tree, Inc. Dual key ring holder. 3,863,477, Cl. 70-456.00R.
Kletschka, Harold D.; and Rafferty, Edson H. Pumps capable of use as heart pumps and blood pumps. 3,864,055, Cl. 415-1.000.
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Knuppel, Helmut; Brotzmann, Karl; Fassbinder, Hans Georg; and Wurm, Peter. Stabilized burnt lime product and process. 3,864,120, Cl. 75-5.000.

Kobayakawa, Masaki: *See—*
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Kohara, Tadao; and Takahashi, Iwao, to Maruzen Sewing Machine Co., Ltd. Thread tensioning device for sewing machines. 3,863,581, Cl. 112-255.000.

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Kollar, Arpad; Takacs, Istvan; Sandor, Bela; and Nepper, Sandor, to Richter Gedeon Vegyeszeti Gyar R.T. Equipment for the inspection of filled ampoules. 3,863,763, Cl. 209-111.700.

Komatsu, Toshiaki: *See—*
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Koontz, Bryce L. Combination insulation stop and ventilation baffle. 3,863,553, Cl. 98-32.000.

Kopczynski, John F. Machine tool. 3,863,792, Cl. 214-340.000.

Kopelman, Bernard, to GTE Sylvania Incorporated. Method of manufacturing miniature incandescent lamps. 3,863,314, Cl. 29-25.150.

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Kozacka, Frederick J., to Chase-Shawmut Company, The. Electric fuse for elevated circuit voltages having a plurality of ribbon fuse links connected in parallel. 3,864,655, Cl. 337-160.000.

Kozinski, David A.; Siczek, Bernard W.; and Carlson, Kenneth L., to Graco Inc. High voltage safety apparatus. 3,864,603, Cl. 317-9.00R.

Kramb, Kenneth D.; Cramer, Richard L.; and Isabell, Walter J., to K.I.C. Incorporated. Empty container washer. 3,863,658, Cl. 134-131.000.

Kramer, George A. Building block game. 3,863,918, Cl. 273-1.00R.

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Krauss, Hans Gunter, to Elmeg Elektro-Mechanik GmbH. Resetting device for counter drums. 3,864,553, Cl. 235-144.0HC.

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Krenzer, John; and Richter, Sidney B., to Velsicol Chemical Corporation. Aryl urea carbonates. 3,864,377, Cl. 260-463.000.

Kreuter, Walter, to Linde Aktiengesellschaft. Tube furnace for thermal decomposition process. 3,863,607, Cl. 122-333.000.

Krieger, Frank C., to United States of America, Army. Low conductivity thermal insulator for thermal batteries. 3,864,170, Cl. 136-83.00T.

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Kubo, Shuji; and Ando, Yoshio, to Matsushita Electric Industrial Company, Limited. Target structure for single tube type color television cameras. 3,864,724, Cl. 357-31.000.

Kubota, Hiroaki: *See—*
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Kudamatsu, Akio; Miyamoto, Masao; and Fukazawa, Nobuo, to Bayer Aktiengesellschaft. Substituted Benzyl-Thiolcarbamate Acid Esters as Herbicides. 3,863,474, Cl. 71-100.000.

Kuehn, Erich, to Atlas Chemical Industries, Inc. Flame retardant and intumescent compositions. 3,864,135, Cl. 106-15.0FP.

Kuehnle, Manfred R., to Coulter Information Systems, Inc. Shutterless camera system. 3,864,035, Cl. 355-14.000.

Kugle, John L.; and Futty, Robert C., to Irl Daffin Associates, Inc. Dust abatement system for mixing apparatus. 3,863,849, Cl. 241-152.00A.

Kuhlmann, Peter; and Beschorner, Franz, to Maschinenfabrik-Augsburg-Nurnberg Aktiengesellschaft. Heater apparatus of a hot gas external combustion piston engine. 3,863,451, Cl. 60-522.000.

Kuhnlein, Hans; and Rehahn, Helmut, to Siemens Aktiengesellschaft. Overload protection for miniature d-c motors. 3,864,605, Cl. 317-13.00R.

Kume, Yoshiharu: *See—*
Katsube, Junki; Takashima, Yoshinori; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Akatsu, Mitsuhiro; Mori, Kazuo; Katsuki, Isao; Kume, Yoshiharu; Sato, Hiromi; Inaba, Shigeho; and Yamamoto, Hisao, 3,864,330.

Kuns, Roger R.; and Orwig, Nelson, to Westvaco Corporation. Display stand. 3,863,575, Cl. 108-111.000.

Kupcikevicius, Vytautas; and Myles, Michael Joseph, to Union Carbide Corporation. Method for producing a large sausage product having a pre-flattened end. 3,864,494, Cl. 426-284.000.

Kuraray Co. Ltd.: *See—*
Maeawa, Minoru; and Morioka, Hiroka, 3,864,148.
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Kurihara, Tsuneaki; and Saka, Kenji, to Kanebo Kabushiki Kaisha; and Yoshida Kogyo Kabushiki Kaisha. Push-button-type cap for container. 3,863,798, Cl. 215-301.000.

Kuriyagawa, Mamoru: *See—*
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Kurke, Edward J.; and Bartholomew, Roy E., to Bendix Corporation, The. Inverting limiting relay valve with interlock. 3,863,992, Cl. 303-9.000.

Kuroda, Hiroshi: *See—*
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Kussy, Frank W.: *See—*
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Kuzma, Edward J., to Celanese Corporation. Baked Alkyd Resin Enamel Coating Compositions Cross-Linked with Etherified Trimethylolated Crotonylidenediurea or Etherified Methylolated 2,7-Dixo- 4, 5 -Dimethyl- Decahydropyrimido- (4, 5-d) -Pyrimidine. 3,864,292, Cl. 260-21.000.
L. F. Lang & Son Pools, Inc.: *See—*
Lang, Robert S.; and Carnot, Robert L., 3,864,262.
Labbe, Francis A. M.: *See—*
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Labecki, Mariusz: *See—*
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Labelle, Bernard C. Cartridge fuse. 3,864,656, Cl. 337-206.000.
Lackey, Robert P., to Texas Instruments Incorporated. Multiplex system for a vehicle. 3,864,578, Cl. 307-10.00R.
Ladany, Shaul P. Cord winding device particularly for fishing rods. 3,863,381, Cl. 43-25.000.
Laford, Herbert M.: *See—*
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La Heij, Gerardus E.; and van Amerongen, Gerrit J., to Shell Oil Company. Polymerization catalyst. 3,864,278, Cl. 252-429.00B.
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La Monica, Luigi. Pizza pie making apparatus and method. 3,864,071, Cl. 425-470.000.
Lampard, William J., to Kennecott Copper Corporation. Controlled in situ leaching of ore deposits utilizing pre-split blasting. 3,863,987, Cl. 299-4.000.
Landahl, Carl D.: *See—*
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Lang, Robert S.; and Carnot, Robert L., to L. F. Lang & Son Pools, Inc. Pool filter system. 3,864,262, Cl. 210-169.000.
Lanning, Donald W.; Lambin, Leonard J.; and Pratt, John G., to Shell Oil Company. Splash preventor for tank truck loading rack. 3,863,689, Cl. 141-115.000.
Laporte Industries Limited: *See—*
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Laran, Roy J.: *See—*
Shephard, Lawrence H., Jr.; Kobetz, Paul; Laran, Roy J.; and Johnson, Robert W., Jr., 3,864,464.
Lassy, Donald Richard. Transfer press. 3,863,486, Cl. 72-405.000.
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Lau, Philip T.; Salminen, Ilmari F.; and Beavers, Leo E., to Eastman Kodak Company. Novel acylamidophenol photographic couplers. 3,864,366, Cl. 260-404.000.
Lawrence, George N.; and Seid, Melvin C., to Westinghouse Electric Corporation. Automatic brightness control for gated micro-channel plate intensifier. 3,864,595, Cl. 315-12.000.
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Le Count, David J.; and Squire, Christopher John, to Imperial Chemical Industries Limited. 1-formylphenoxy-3-amino-2-propanol derivatives. 3,864,390, Cl. 260-501.170.
Lee, Charles A.: *See—*
MacDonald, Richard C.; Martin, Noel E.; and Lee, Charles A., 3,863,637.
Lee, Hanju: *See—*
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Lee, Yuan C.; and Kline, Jules M., to Environics, Inc. Method for Removing Nitric Oxide from Combustion Gases. 3,864,451, Cl. 423-239.000.
Leeson, Barry G., to Sherwin-Williams Company, The. Sand blow reservoir for a foundry molding machine. 3,863,705, Cl. 164-202.000.
Leeson, John L.: *See—*
DeLong, Vincent R.; Ludvigson, Merrill T.; Apple, Frank M.; Leeson, John L.; and Houghton, Edwin G., 3,864,521.
LeFur, Jean-Pierre, to Enterprise de Recherches et d'Activites Petrolieres. System for storing a flowable mass. 3,864,062, Cl. 417-121.000.
Legardinier, Andre, to Usines Decoufle. Cutting Guide for Machines for Producing Rods, Particularly for Cigarette Machines. 3,863,536, Cl. 83-299.000.
Legate, Roland Arthur; and Strickland, Kevin. Method of lining metal pipes. 3,863,327, Cl. 29-470.100.
Leighty, Conard E.: *See—*
Bridwell, John W.; Leighty, Conard E.; and Wellwood, John G., 3,863,744.
Leikola, E. Juhani, to Orion-yhtyma Oy. Orion Pharmaceutical Co. Method for diagnosis of infectious mononucleosis. 3,864,467, Cl. 424-12.000.
Leiter, Leigh David, to Ametek, Inc. Self-erecting tube device. 3,863,405, Cl. 52-108.000.
Lemelson, Jerome H. Facsimile system and method. 3,864,514, Cl. 178-6.800.
Lentz, Carl A.: *See—*
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Leonard, Clifford R. Fishing gaff. 3,863,377, Cl. 43-6.000.
Leonard, Gerard E.: *See—*
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Leonte, Constantin, to Institutue Politehnic Iasi. Concrete prestressing device. 3,863,891, Cl. 254-29.00A.
Leshnoff, Stephen D.: *See—*
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Leupp, Alex M.; and Dill, Hans G., to Hughes Aircraft Company. Method of fabricating back panel for liquid crystal display. 3,863,332, Cl. 29-580.000.
Leveen, Harry H. Elastic bandage and fastener therefor. 3,863,301, Cl. 24-85.00R.
Leventhal, Stephen Richard. Fingerprint scanning system. 3,864,042, Cl. 256-71.000.
Lever Brothers Company: *See—*
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Levy, Moshe; Pearson, James M.; and Williams, David J., to Xerox Corporation. Process for preparation of photoconductive films from intractable materials. 3,864,144, Cl. 117-34.000.
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Lewis, Eugene C.: *See—*
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Lexel Corporation: *See—*
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Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,864,488.
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Licata, Joseph: *See—*
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Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
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Liebscher, Anton I., to Ro-Search Incorporated. Last and apparatus for removing footwear therefrom. 3,863,284, Cl. 12-135.00A.
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Lincoln, Lewis Lauren; and Heseltine, Donald Warren, to Eastman Kodak Company. Dye lasers including rigidized carbocyanine dyes. 3,864,644, Cl. 331-94.50L.

Linde Aktiengesellschaft: *See—*
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Lindstrom, Olle. Apparatus for the electrolytic production of alkali. 3,864,236, Cl. 204-265.000.

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Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Takano, Koichi; and Yoshikawa, Kiyoshi, 3,864,201.

Lipp, Xaver, to Silo Verfahrens AG. Apparatus for the production of a tube. 3,863,479, Cl. 72-12.000.

Lippitsch, Josef: *See—*
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LKB-Produkter AB: *See—*
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Loads, Frederick Walter, to F. B. Mercer, Limited. Growing of grasses. 3,863,388, Cl. 47-56.000.

Loch, Emil P., to Westinghouse Electric Corporation. Remotely operable explosive plug insertion tool. 3,863,976, Cl. 294-97.000.

Locketz, Harry B., to Cryogenic Recycling International Inc. Fuel composition. 3,864,094, Cl. 44-1.00G.

Loeb, David C.; and Trestman, Robert. Multispeed, chainless vehicle drive system. 3,863,503, Cl. 74-347.000.

Loeb, William E.; and Spivack, Mark A., to Union Carbide Corporation. Support media with supported object. 3,864,202, Cl. 161-162.000.

Loew Opta GmbH: *See—*
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Loftfield, Richard E., to Diamond Shamrock Corporation. Bipolar diaphragmless electrolytic cells. 3,864,237, Cl. 204-268.000.

Logrippo, Gerald A., to Spectroderm International Inc. Apparatus for sterilizing biologic material and the like by ultra-violet irradiation. 3,864,081, Cl. 21-102.00R

Lombaerde, Robert P.: *See—*
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Lombardo, Michael S.: *See—*
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Long, Ernest L.; Russell, Ronald W.; and Solomon, James E., to Motorola, Inc. Second stage overload protection for amplifiers. 3,864,642, Cl. 330-207.00P.

Long, James R., to United States of America, Atomic Energy Commission. Doppler-shift velocity measurement system using a two-frequency laser. 3,864,041, Cl. 356-28.000.

Long Manufacturing Co., Inc.: *See—*
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Lore, Gregory. Bait saver. 3,863,383, Cl. 43-44.800.

Lovens Kemiske Fabrik Produktionsaktieselskab: *See—*
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Lubrizol Corporation, The: *See—*
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Lucas Electrical Company Limited, The: *See—*
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Lynch Communication Systems, Inc.: *See—*
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Lynch, James Edward, to AMP Incorporated. Coined post for solder stripe. 3,864,014, Cl. 339-275.00R.

Lynn, Charles C. Process of preparing an egg yolk substitute and resulting products from its use. 3,864,500, Cl. 426-195.000.

Lyshkow, Norman A., to Combustion Equipment Associates, Inc. Method and apparatus for the analysis of a dispersed phase capable of transmitting and focusing light. 3,864,044, Cl. 356-201.000.

M & T Manufacturing Company: *See—*
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MacDermid Incorporated: *See—*
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MacDonald, Frank; Gardner, David Michael; and Stephens, Roy, to Glacier Metal Company, The. Press and method for coin pressing articles. 3,863,485, Cl. 72-345.000.

MacDonald, Richard C.; Martin, Noel E.; and Lee, Charles A., to International Paper Company. Folded disposable diaper. 3,863,637, Cl. 128-287.000.

Macias, Helene; and Winke, Angos. Moisture detector. 3,864,676, Cl. 340-235.000.

Mack, Alfred H.: *See—*
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Madaus, Rolf, to Dr. Madaus & Co. Therapeutic compositions and methods using silymarin comprising poly-hydroxyphenyl chromanones. 3,864,484, Cl. 424-195.000.

Maeawa, Minoru; and Morioka, Hiroka, to Kuraray Co. Ltd. Process for production of metal-plated fibers. 3,864,148, Cl. 117-47.00A.

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Mahnau, Heinrich: *See—*
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Maier, James J. Binary phase coded navigation system (bicons). 3,864,682, Cl. 343-113.00R.

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Malmin, Oscar. Dental patient drape. 3,863,343, Cl. 32-1.000.

Malmin, Oscar. Endodontic sealing system and apparatus. 3,863,345, Cl. 32-15.000.

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Mansi, Joseph S.; and Spence, Larry W., to Charles Machine Works, Inc., The. Jacking apparatus for a trailer tongue. 3,863,894, Cl. 254-86.00R.

Marchaj, Tadeusz Josef: *See—*
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Marchant, Wayne N., to United States of America, Interior. Removal of Mercury From Solutions. 3,864,327, Cl. 260-231.00A.

Marforio, Nerino, to S.p.A. Virginio Rimoldi & Co. Low-inertia presserfoot for sewing machines. 3,863,580, Cl. 112-212.000.

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Markley, Finley W., to Galen Laboratories, Inc. Edge sealed folded membrane. 3,864,265, Cl. 210-321.000.

Marks, Richard Earl, to RCA Corporation. Battery connecting assembly. 3,864,172, Cl. 136-173.000.

Maroschak, Ernest J., to Plastic Tubing, Inc. Method of converting corrugated pipe molding machine. 3,864,446, Cl. 264-95.000.

Marshall, Elmer, to Olinkraft, Inc. Waterproof Corrugated Board. 3,864,200, Cl. 161-135.000.

Marshall, Robert K.: *See—*
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Marsico, Joseph William, Jr.; Joseph, Joseph Peter; and Goldman, Leon, to American Cyanamid Company. 5-Amino-3-ethyl-1-phenyl-4-pyrazolecarboxamides and method of preparation thereof. 3,864,359, Cl. 260-310.00R.

Martin, Henry; Rohr, Otto; Duerr, Dieter; Janiak, Stefan; Pissiotas, Georg; and Toepfl, Werner, to Ciba-Geigy AG. Phenyl ureas, their use as selective herbicides. 3,864,395, Cl. 260-553.00A.

Martin, James C.: *See—*
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Martin, Robert J., to Cessna Aircraft Company, The. Automatic torque limitation control. 3,864,063, Cl. 417-222.000.

Martin, Stephen J.: *See—*
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Martin, Thomas W., Sr., to Cutters Machine Company, Inc. Roll storage device having an elevator with pivotal load supporting means. 3,863,778, Cl. 214-16.40R.

Martin, William B.: *See—*
Viglione, Sam S.; Ordon, Vladimir A.; Martin, William B.; and Kesler, Carl C., Jr., 3,863,625.

Maruzen Sewing Machine Co., Ltd.: *See—*
Kohara, Tadao; and Takahashi, Iwao, 3,863,581.

Marwede, Gunter: *See—*
Nast, Roland; Redetzky, Wolfgang; Sinn, Gustav; Kempermann, Theo; Witte, Joseph; and Marwede, Gunter, 3,864,307.

Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Fiber reinforced elastomers. 3,864,203, Cl. 161-175.000.

Maschinenfabrik-Augsburg-Nurnberg Aktiengesellschaft: *See—*
Kuhlmann, Peter; and Beschorner, Franz, 3,863,451.

Maschinenfabrik Sack GmbH: *See—*
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Maschinenfabrik Zuchermann Komm-Ges. Wien: *See—*
Schmidt, Erich, 3,863,691.

Mascitti, Albert A.: *See—*
Sulkowski, Theodore S.; and Mascitti, Albert A., 3,864,360.

Mashuda, David J. Giant Tree Chopper. 3,863,848, Cl. 241-101.700.

Maslennikov, Ivan Egorovich: *See—*
Deordiev, Nikolai Trifonovich; Kononov, Ivan Vasilievich; Maslennikov, Ivan Egorovich; Modzheevsky, Gennady Vitalievich; Platonov, Vladimir Nikiforovich; and Sukhanov, Vasily Tikhonovich, 3,863,488.

Massey, Robert E.: *See—*
Hansen, Laurence H.; Massey, Robert E.; and Wojnowski, Aloysius, 3,864,688.

Masterjoseph, Liebert J., to Raymond Lee Organization, Inc., The. Aquarium sediment trap. 3,864,261, Cl. 210-163.000.

Masters, Richard M. Heat exchange system. 3,863,710, Cl. 165-46.000.

Mastrangelo, Sebastian Vito Rocco, to du Pont de Nemours, E. I., and Company. Diode array-forming electrical element. 3,864,715, Cl. 357-1.000.

Masuda, Keizo: *See—*
Takeyama, Tetsu; Endoh, Ryoh; and Masuda, Keizo, 3,864,450.

Mata, Justo Martinez: *See—*
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Mathes, Harold A.: *See—*
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Mathews, Victor M., Jr.: *See—*
Normile, James M.; Mathews, Victor M., Jr.; and Lilly, Eugene Brooks, 3,864,608.

Matsuda, Kazuo; Tanaka, Yoshiaki; and Sakai, Takeyo, to Kao Soap Co., Ltd. Process for polymerizing tetrahydrofuran. 3,864,287, Cl. 260-2.0XA.

Matsuoka, Hirofusa: *See—*
Kan, Masao; Hyodo, Hiroshi; Matsuoka, Hirofusa; Watanabe, Akio; and Enami, Shigekazu, 3,864,275.

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Matsushita Electric Industrial Company, Limited: *See—*
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Mattel, Inc.: *See—*
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Matthews, Donald H. Camera carrying case. 3,864,711, Cl. 354-354.000.

Matthews, Hugh B.: *See—*
van de Vaart, Herman; Matthews, Hugh B.; and Worley, James C., 3,863,497.

Mattox, Douglas M.; and Toth, Joseph W., to Westinghouse Electric Corporation. Method of forming a glass-ceramic to metal seals. 3,864,112, Cl. 65-43.000.

Mavrovic, Ivo. Apparatus for the decomposition of ammonium carbamate. 3,864,091, Cl. 23-283.000.

Maxwell, Bryce. Apparatus and method for processing plastic material. 3,863,905, Cl. 259-191.000.

Maxwell, David James; and Towner, Frank Richard, to Sperry Rand Limited. Data recorders. 3,864,737, Cl. 360-63.000.

May, John E.: *See—*
Child, Edward T.; May, John E.; and Stephanek, William D., 3,864,346.

Mayne, Robert C.: *See—*
United States of America, National Aeronautics and Space Administration; Dillon, Robert F., Jr.; and Mayne, Robert C., 3,863,881.

McCarthy, John Felix: *See—*
Harrison, Ian Robert; McCarthy, John Felix; and Palmer, Bryan Harper, 3,864,497.

McClure, Charles Laird, to Pro-Tech Inc. Liquid sampling. 3,863,506, Cl. 73-421.00B.

McClure, James D., to Shell Oil Company. Synthesis of Ethyl Vinyl Ketone. 3,864,404, Cl. 260-597.00R.

McCrae, James McGeachie: *See—*
Inman, Eric Richard; McCrae, James McGeachie; Midcalf, Christopher; and Turner, Alison, 3,864,371.

McDonnell, James A.; McGuire, Robert E.; and Radlinsky, Raymond, to International Business Machines Corporation. Time dependent deflection control for ink jet printer. 3,864,692, Cl. 346-75.000.

McDowell, Curtis S.: *See—*
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McDowell, John W.; and Winstrom, Leon O., to Allied Chemical Corporation. Catalytic reduction of nitroparaffins to oximes and catalyst therefor. 3,864,399, Cl. 260-566.00A.

McFarland, David L.: *See—*
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McFarland, Raymond J.; and McFarland, David L. Fertilizer applicator. 3,863,842, Cl. 239-283.000.

McGilvery, James D.: *See—*
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McGuire, Robert E.: *See—*
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McKenna, Ronald F.: *See—*
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McLoughlin, Bernard J. Form for concrete steps. 3,863,885, Cl. 249-184.000.

McMillan, Clyde H., to Fire Task Force Innovations, Inc. Automatic fire nozzle with automatic control of pressure and internal turbulence combined with manual control of variable flow and shape of stream produced. 3,863,844, Cl. 239-452.000.

McVickers, Jack C., to Westinghouse Electric Corporation. Microwave phase shifter and method for its manufacture. 3,864,648, Cl. 333-31.00R.

McWilliams, Roy J., to Decair Helicopters, Inc. Helicopter-mountable landing platform and work scaffold and method of placing same in operating position. 3,863,736, Cl. 182-150.000.

McWilliams, Roy J., to Decair Helicopters, Inc. Releasable clamp. 3,863,911, Cl. 269-152.000.

Meadow, Theodore B. Cover for utility outlet. 3,864,512, Cl. 174-66.000.

Meadows, Roger D., to Dayco Corporation. Endless power transmission belt. 3,863,515, Cl. 74-231.00R.

Meads, Charles D.; and Hefler, Paul R., to Dico Company, Inc. Adjustable support for a material handling fork. 3,863,971, Cl. 294-67.0AA.

Mech-El Industries, Inc.: *See—*
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Medical College of Georgia Foundation Inc.: *See—*
Trueblood, Jon H.; Rossomondo, Roger M.; and Carlton, William H., 3,863,623.

Medical Development Corporation: *See—*
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Meditec, Inc.: *See—*
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Medovar, Boris Izrailevich; Lanevsky, Valery Evgenievich; Alferov, Jury Fedorovich; Dubinsky, Rudolf Solomonovich; Berezovsky, Mikhail Elevich; Chekotilo, Leonty Vasilievich; Pavlov, Leonid Viktorovich; Ishunkin, Veniamin Alexandrovich; Shevtsov, Anatoly Ivanovich; and Grinshpon, Semen Yakovlevich. Plant for the electroslag melting of hollow ingots. 3,863,699, Cl. 164-252.000.

Meginnis, George B., to General Motors Corporation. Angular discharge porous sheet. 3,864,199, Cl. 161-112.000.

Meguro, Kanji; and Kuwada, Yutaka, to Takeda Chemical Industries, Ltd. Method for preparing S-Triazolo (4,3-A) (1,4) Benzodiazepine Derivatives. 3,864,356, Cl. 260-308.00C.

Meiel, Samuel P.: *See—*
Bodycomb, Alistair K.; Meiel, Samuel P.; Shebry, Cameron W.; and Thompson, Garth N., 3,863,412.

Meier, Arnold; and Trippel, Karl, to BBC Brown Boveri & Co. Ltd. Hydraulic drive for switchgear. 3,863,547, Cl. 91-416.000.

Meikis, Harold T.: *See—*
Plumb, Edwin W.; and Meikis, Harold T., 3,863,487.

Meinders, Gerardus J.: *See—*
Goodwin, Edwin C., Jr.; Holden, Lynne A.; and Meinders, Gerardus J., 3,864,534.

Meisenheimer, Daniel T., Jr. Vibration isolation mounting assembly. 3,863,871, Cl. 248-15.000.

Melaja, Asko J.; and Hamalainen, Lauri, to Suomen Sokeri Osakeyhtio (Finnish Sugar Company). Process for the production of mannitol and sorbitol. 3,864,406, Cl. 260-637.00R.

Melamed, Nathan T.: *See—*
Phillips, David C.; and Melamed, Nathan T., 3,864,646.

Melin, Martin James; and Wallace, Rodney Lee, to Union Carbide Corporation. Gripper-transfer device for plastic bags. 3,863,549, Cl. 93-35.00R.

MEM Controls, Inc.: *See—*
Hammond, Peter W., 3,864,618.

Memorex Corporation: *See—*
Hargis, James V., 3,864,755.

Meng, Karl: *See—*
Horstmann, Harald; Wollweber, Hartmund; and Meng, Karl, 3,864,495.

Mentessi, Roland A., to General Motors Corporation. Operating linkage for bottom dump doors. 3,863,986, Cl. 298-35.00M.

Mentha, John W.: *See—*
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Meopta, narodni Podnik: *See—*
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Mercier, Robert L., to Dominion Engineering Works, Limited. Oscillator system for paper machine. 3,863,453, Cl. 60-539.000.

Merck & Co., Inc.: *See—*
Miller, Brinton M.; and Burg, Richard W., 3,864,479.
Schultz, Everett M.; and Cragoe, Edward J., Jr., 3,864,401.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
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Merrill, Thomas M. Shipping and Display Container for Fresh Products Such As Asparagus. 3,863,829, Cl. 229-16.00D.

Merrin, Seymour, to Innotech Corporation. Rectifying junction device employing a glassy amorphous material as an active layer. 3,864,716, Cl. 357-2.000.

Merrin, Seymour, to Innotech Corporation. Photoresponsive junction device employing a glassy amorphous material as an active layer. 3,864,717, Cl. 357-2.000.

Merrin, Seymour, to Innotech Corporation. Multiple junction device employing a glassy amorphous material as an active layer. 3,864,718, Cl. 357-2.000.

Merrin, Seymour, to Innotech Corporation. Light emitting junction device employing a glassy amorphous material as an active layer. 3,864,720, Cl. 357-17.000.

Merrin, Seymour, to Innotech Corporation. Photoconductive junction device employing a glassy amorphous material as an active layer. 3,864,725, Cl. 357-31.000.

Meserole, Robert H., to Johns-Manville Corporation. Apparatus for forming corrugated strip material into helically wound tubing. 3,863,480, Cl. 72-50.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
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Metallgesellschaft Aktiengesellschaft: *See—*
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Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,864,488.

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Meuschke, Robert E.: *See—*
Shallenberger, John M.; Meuschke, Robert E.; and Desmarchais, Walter E., 3,863,770.

Meyer, Alfred L., to Anetsberger Brothers, Inc. Depanning machine. 3,863,788, Cl. 214-302.000.

Michrina, Regis C., to Allied Leisure, Inc. Suspension system for tracked vehicles. 3,863,727, Cl. 180-5.00R.

Microbyx Corporation: *See—*
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Microwire Corporation: *See—*
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Midcalf, Christopher: *See—*
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Midland-Ross Corporation: *See—*
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Mielke, Bodo, to Rollei-Werke Franke & Heidecke. Diaphragm adjusting mechanism for photographic cameras. 3,864,700, Cl. 354-43.000.

Mikami, Takashi: *See—*
Bekki, Shigeharu; Yamataka, Akihiro; Mikami, Takashi; and Kishimoto, Juji, 3,864,677.

Miklos, Richard L.; and Blackburn, Jack E., to Minnesota Mining and Manufacturing Company. Magnetic record medium having permanent record pattern and information processing system using said medium. 3,864,754, Cl. 360-131.000.

Milik, Rudolf Ferdinand Leon, to Design Link. Mixing of fragile granular materials. 3,863,904, Cl. 259-148.000.

Millar, James S.; and Gardner, Charles V., to Parker-Hannifin Corporation. Convertor for top loading tanks. 3,863,688, Cl. 141-59.000.

Miller, Albert: *See—*
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Miller, Arthur William; and Atkinson, William, to Laporte Industries Limited. Process for the production of alumina. 3,864,461, Cl. 423-628.000.

Miller, Brinton M.; and Burg, Richard W., to Merck & Co., Inc. Boromycin as a coccidiostat. 3,864,479, Cl. 424-185.000.

Miller, Calvin Max, to Bell Telephone Laboratories, Incorporated. Method and means for splicing arrays of optical fibers. 3,864,018, Cl. 350-96.00C.

Miller, Edward F.: *See—*
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Miller, Leroy J.: *See—*
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., 3,864,309.

Millet, Jean Joseph, to S.O.C.O.P. S.A. Lamp socket. 3,864,001, Cl. 339-127.000.

Mills, George J.: *See—*
Crandall, Walter E.; Mills, George J.; and Brown, Gary G., 3,864,184.

Mills, Richard L. Safety container. 3,863,795, Cl. 215-9.000.

Mills, Terence; Wiacek, Marian; Gillespie, Peter James; and Hatcher, Clive Douglas, to Energy Conversion Limited. Electrochemical cells. 3,864,171, Cl. 136-107.000.

Milwaukee Valve Company, Inc.: *See—*
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Minamida, Hisatsugu: *See—*
Nakane, Ryuichi; and Minamida, Hisatsugu, 3,864,427.

Minnesota Mining and Manufacturing Company: *See—*
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Fridinger, Tomas L.; Mutsch, Edward L.; and Pauly, David R., 3,864,397.
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Mirtain, Henir J., to Uniroyal, a Societe Anonyme. Pneumatic tires and breakers therefor. 3,863,695, Cl. 152-361.0FP.

Mitani, Seishu: *See—*
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Mitin, Leonid Alexeevich: *See—*
Voitsekhovsky, Bogdan Vyacheslavovich; Nikolaev, Valentin Pavlovich; Shoikhet, Grigory Yankelevich; Mitin, Leonid Alexeevich; Dimova, Lidia Petrovna; and Samusenko, Vladimir Alexeevich, 3,863,989.

Mitsubishi Denki Kabushiki Kaisha: *See—*
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Mitsubishi Electric Corporation: *See—*
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Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
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Mitsubishi Kinzoku Kogyo Kabushiki Kaisha: *See—*
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Mitsui Mining & Smelting Co., Ltd.: *See—*
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Mitsui Shipbuilding and Engineering Co., Ltd.: *See—*
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Mitsuishi, Yoshiji; and Aihara, Toru, to Caterpillar Mitsubishi Ltd. Control system for winding power supply cable. 3,863,741, Cl. 191-12.20A.

Mittendorf, Theodor H. Vehicle insect protection apparatus. 3,863,728, Cl. 180-68.00P.

Miura, Shunji: *See—*
Akiyama, Nobuyuki; Miura, Shunji; and Chisaka, Haruo, 3,864,174.

Miyajima, Toru, to Minolta Camera Kabushiki Kaisha. Planetarium. 3,863,363, Cl. 35-42.500.

Miyamoto, Masao: *See—*
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Miyata, Yoshio: *See—*
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Miyatuka, Hajime, to Fuji Photo Film Co., Ltd. Method for preparing $ZnO\text{-}TiO_3$ bichargeable electrophotographic material. 3,864,127, Cl. 96-1.800.

Miyoshi, Hiroshi; Mori, Hirohumi; and Tanoue, Yoriko, all of, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Photo-Degradable Styrene Resin Composition. 3,864,293, Cl. 260-23.70R.

Mizelle, Ned W., to Hoover-Seng Company. Settee-bed with backrest convertible to an upper bed. 3,863,280, Cl. 5-9.00R.

Mizoguchi, Hiroaki: *See—*
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Mizukami, Ichiro; and Takahasi, Masahiro, to Nippon Light Metal Research Laboratory Limited. Method for Producing Wrought Aluminum Articles Having a Colored Anodic Oxidation Film. 3,864,218, Cl. 204-29.000.

MKC Electronics Corporation: *See—*
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Mobil Oil Corporation: *See—*
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Modler, Robert F.; and Harrison, Stuart A., to General Mills Chemicals, Inc. Flexible polyester resins. 3,864,314, Cl. 260-75.00R.

Modzheevsky, Gennady Vitalievich: *See—*
Deordiev, Nikolai Trifonovich; Kononov, Ivan Vasilievich; Maslennikov, Ivan Egorovich; Modzheevsky, Gennady Vitalievich; Platonov, Vladimir Nikiforovich; and Sukhanov, Vasily Tikhonovich, 3,863,488.

Moffatt, E. Marston, to United Aircraft Corporation. Vibrating cylinder pressure transducer. 3,863,505, Cl. 73-398.00R.

Moffatt, James H.: *See—*
Weatherston, John; and Moffatt, James H., 3,863,384.

Mohler, Galen E., to Lexel Corporation. Laser mirror mount and window protection assembly. 3,864,029, Cl. 350-288.000.

Mohler, Ingeborg, heiress: *See—*
Pistor, Horst; Simmersbach, Edmund, deceased; Mohler, Ingeborg, heiress; Schaller, Artur; and Knippschild, Gerd, 3,864,454.

Mohr-Baker Co.: *See—*
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Mohr, Carsten. Pillow with interior storage compartment. 3,863,283, Cl. 5-341.000.

Mohr, Glenn R., to Mohr-Baker Co. Continuously modulated electrode boiler. 3,864,543, Cl. 219-285.000.

Moliard, Henry. Star finder. 3,863,365, Cl. 35-44.000.

Moline, Kenneth R.; Franz, Maurice F.; and Webber, Philip S., to Caterpillar Tractor Company. Limit mechanism for manual shift control lever. 3,863,520, Cl. 74-475.000.

Molins, Desmond W.; Labbe, Francis A. M.; Parkinson, Harry; Kirk, Peter; and Hayward, Robert J., to Molins Limited. Method and apparatus for testing cigarettes. 3,863,491, Cl. 73-37.000.

Molins Limited: *See—*
Molins, Desmond W.; Labbe, Francis A. M.; Parkinson, Harry; Kirk, Peter; and Hayward, Robert J., 3,863,491.

Molloy, Gerald F., to Caterpillar Tractor Company. Combined draining and brake adjustment means for a band brake assembly. 3,863,738, Cl. 188-77.00R.

Monday, William C.: *See—*
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Moni, Inc.: *See—*
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Monsanto Company: *See—*
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Monteratini Edison S.p.A: *See—*
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Moomey, Henry, to Geute, Harvey J. Suspended ceiling construction. 3,863,413, Cl. 52-484.000.

Moore, Jimmie L.: *See—*
Peiffer, Jack S.; Thelen, Donald J.; and Moore, Jimmie L., 3,863,420.

Morane, Bruno P.; and Boulogne, Jean, to Societe Anonyme dite: L'Oreal. Cosmetic applicator. 3,863,654, Cl. 132-88.700.

Morby, John Alfred; Rich, Joseph Francis; and Grade, George Henry, Jr., to General Electric Company. Non-metallic load center for surface and recessed wall mounting. 3,864,511, Cl. 174-58.000.

Mori, Hirohumi: *See—*
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Mori, Kazuo: *See—*
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Mori, Kenichi; Nakayama, Naoto; and Osawa, Takeshi, to Tokyo Shibaura Electric Co., Ltd. Apparatus for classifying sheet-like material. 3,864,559, Cl. 235-151.200.

Mori, Yoichi; Okazaki, Nobuo; Ohtsuka, Kunio; and Iijima, Tetsuya, to Nissan Motor Company, Limited. Gear train arrangements. 3,863,524, Cl. 74-765.000.

Moriaud, Guy: *See—*
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Morin, Albert Z.; and Boyd, Thomas H., to Trans-Continental Purification Research and Development Ltd. Method of Apparatus for Treating Sewage. 3,864,252, Cl. 210-59.000.

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Morita, Akiyoshi: *See—*
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Moritz, Edward M. Board game apparatus. 3,863,927, Cl. 273-131.00K.

Moriyama, Akio; Fukai, Masakazu; and Asai, Komei, to Matsushita Electric Industrial Company, Limited. Color switching liquid crystal display. 3,864,022, Cl. 350-160.0LC.

Moroney, Martin A. Athlete's glove and pad. 3,863,271, Cl. 2-161.00A.

Morz, Gunter, to Licentia Patent-Verwaltungs-G.m.b.H. Arrangement for an automatic resetting system for microwave antennas. 3,864,683, Cl. 343-113.00R.

Moser, Richard M.; Kantarian, Edward T.; and Nixon, Raymond F., to Moni, Inc. Two speed grinding machine. 3,863,398, Cl. 51-134.500.

Motorola, Inc.: *See—*
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Kraybill, Albert V.; Rapshys, William; and Yester, Francis R., 3,863,330.
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Mueller, Hans W.: *See—*
Perry, Donald S.; Fowler, Wyland L.; Shattuck, Richard E.; and Mueller, Hans W., 3,863,749.

Mueller, Joachim; and Dengler, Ludwig, to Agfa-Gevaert Aktiengesellschaft. Xerographic Copying Apparatus. 3,863,602, Cl. 118-636.000.

Mueller, Wolfgang H., to Mueller, Wolfgang H. Selective chlorination of olefins in fused salts. 3,864,411, Cl. 260-660.000.

Mulaskey, Bernard F.: *See—*
Clippinger, Everett; and Mulaskey, Bernard F., 3,864,284.

Muller, Johann, deceased: *See—*
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Muller, Jurgen: *See—*
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Reeber, Rudolf; Hofmeister, Peter; Strobl, Heinrich; and Muller, Johann, deceased, 3,863,544.

Muller, Philip O. Detachable warning light. 3,863,999, Cl. 339-10.000.

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Paradis, Arthur George; and Paradis, Guy B. Float type liquid level switch. 3,864,538, Cl. 200-84.00B.

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Paradis, Arthur George; and Paradis, Guy B., 3,864,538.

Pareja, Ramon, to Lear Siegler, Inc. Centrifugal pump mount. 3,863,517, Cl. 74-242.160.

Parker, Alene McCall. Quick-Acting Releasable Tube Connectors. 3,864,048, Cl. 403-27.000.

Parker, Charles Weber, to Dresser Industries, Inc. Retrievable well packer with reversing feature and method of use thereof. 3,863,719, Cl. 166-305.00R.

Parker-Hannifin Corporation: *See—*
Millar, James S.; and Gardner, Charles V., 3,863,688.
Tarsha, Manuel A., 3,863,676.
Tarsha, Manuel A., 3,863,677.

Parkes, Ralph C. Monorail truck tray loader. 3,863,685, Cl. 141-1.000.

Parkinson, Harry: *See—*
Molins, Desmond W.; Labbe, Francis A. M.; Parkinson, Harry; Kirk, Peter; and Hayward, Robert J., 3,863,491.

Passarella, Michael T.: *See—*
Farnam, Robert G.; and Passarella, Michael T., 3,863,936.

Patchett, Georges: *See—*
Pellett, Jacques Pierre; Baisan, Henri Bernard Andre; Lievaux, Jean; and Patchett, Georges, 3,864,577.

Patricia, John; and Mack, Alfred H., to Singer Company, The. Convertible sewing machine beds. 3,863,582, Cl. 112-258.000.

Patriquin, George P., to Hudson Lock, Inc. Pick resistant lock. 3,863,476, Cl. 70-419.000.

Patterson, Henry G. Stable synthetic carpet backing material. 3,864,195, Cl. 161-66.000.

Patykula, Thomas E., to Corning Glass Works. Apparatus for imprinting on moving articles without smearing the imprint. 3,863,565, Cl. 101-44.000.

Paukert, Miloslav; and Schwarzova, Libuse, to Meopta, narodni Podnik. Three component reproduction objective. 3,864,028, Cl. 350-227.000.

Pauly, David R.: *See—*
Fridinger, Tomas L.; Mutsch, Edward L.; and Pauly, David R., 3,864,397.

Pavljuk, Galina Sergeevna: *See—*
Rabinovich, Meri Solomonovna; Povarov, Leonard Sergeevich; and Pavljuk, Galina Sergeevna, 3,864,332.

Pavlov, Leonid Viktorovich: *See—*
Medovar, Boris Izrailevich; Lanevsky, Valery Evgenievich; Alferov, Jury Fedorovich; Dubinsky, Rudolf Solomonovich; Berezovsky, Mikhail Elevich; Chekotilo, Leonty Vasilievich; Pavlov, Leonid Viktorovich; Ishunkin, Veniamin Alexandrovich; Shevtsov, Anatoly Ivanovich; and Grinshpon, Semen Yakovlevich, 3,863,699.

Pawlina, Julian S., to Tecumseh Products Company. Muffler for internal combustion engines. 3,863,734, Cl. 181-49.000.

Pearson, James M.: *See—*
Levy, Moshe; Pearson, James M.; and Williams, David J., 3,864,144.

Peeples, Maurice E. Golf practice range and method of retrieving balls hit thereon. 3,863,922, Cl. 273-35.00B.

Peer, Charles F.: *See—*
Campagnuolo, Carl J.; and Peer, Charles F., 3,863,572.

Peiffer, Jack S.; Thelen, Donald J.; and Moore, Jimmie L., to J. T. Thorpe Company. Apparatus for installing bricks in a kiln. 3,863,420, Cl. 52-749.000.

Pejcha, Ivan, to Storage Disk Corporation. Multiple pack magnetic disk system. 3,864,747, Cl. 360-98.000.

Pekau, Dietlind, to Siemens Aktiengesellschaft. Process for recording acoustic, synthetic and microwave holograms. 3,864,665, Cl. 340-5.00H.

Pelios, Angelo: *See—*
O'Neil, John Tettemer, Jr.; Pelios, Angelo; Simon, Allen Henry; and Nickl, Frank George, 3,864,548.

Pellet, Bernard. Process and equipment for the manufacture of wiring harnesses and similar components. 3,863,319, Cl. 29-203.0MW.

Pellett, Jacques Pierre; Baisan, Henri Bernard Andre; Lievaux, Jean; and Patchett, Georges, to British Petroleum Company Limited, The. Tank filling monitor. 3,864,577, Cl. 250-577.000.

Peltz, Hanns-Heinz; Pretsch, Hubert; and Schmitter, Detlev, to Siemens Aktiengesellschaft. Semiconductor components having bimetallic lead connected thereto. 3,864,728, Cl. 357-71.000.

Pendleton, Leland W. Adjustable doughnut machine. 3,864,070, Cl. 425-287.000.

Pennwalt Corporation: *See—*
Goltz, Kurt; and Blum, William Adrian, 3,864,175.

Pensak, Philip; and Januszewski, Joseph P., to Colgate-Palmolive Company. Clear lemon-flavored mouthwash. 3,864,472, Cl. 424-54.000.

Peonski, Edward, to American Gage & Machine Company. Gaging apparatus with flow control mechanism. 3,863,352, Cl. 33-174.00R.

Peppler, Richard B.; and Rosskopf, Philip A., to Martin Marietta Corporation. Cement set accelerator. 3,864,290, Cl. 260-17.500.

Percy, Andrew Wilson, to Hall-Thermotank International Limited. Cooling system. 3,864,442, Cl. 261-151.000.

Perlman, Morris, to Carbide Form Grinding, Inc. Method and apparatus for automatically attaching top stops to a continuous slide fastener chain. 3,863,321, Cl. 29-207.5ST.

Perrault, Marcel Antoine: *See—*
Thuillier, Yvonne; and Perrault, Marcel Antoine, 3,864,477.

Perry, Donald S.; Fowler, Wyland L.; Shattuck, Richard E.; and Mueller, Hans W., to SCM Corporation. Spoolless ribbon cartridge with lift and feed features combined. 3,863,749, Cl. 197-151.000.

Perry Industries, Inc.: *See—*
Wilson, David A., 3,863,349.

Perry, John A., to Regis Chemical Company. Liquid-solid adsorption chromatography. 3,864,250, Cl. 210-31.00C.

Perry, Roger L., to Gillette Company, The. Plural edge shaving system. 3,863,340, Cl. 30-346.580.

Personal Communications, Inc.: *See—*
Yevick, George J., 3,864,034.

Pesaro, Mario: *See—*
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Peterson, Dean M.: *See—*
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Peterson, Ivan A.: *See—*
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Petrie, Frank J. Internal combustion engine. 3,863,613, Cl. 123-75.00R.

Pettersson, Birger; and Sangfors, Bo, to Svenska Rotor Maskiner Aktiebolag. Pipe grating structure. 3,863,678, Cl. 138-37.000.

Petty, John William Edward: *See—*
Hope, Eric; and Petty, John William Edward, 3,863,896.

Pezzini, Amedeo: *See—*
Zimatore, Carmelo; and Pezzini, Amedeo, 3,863,509.

Pfanzelt, Josef. Electrical switching device. 3,864,604, Cl. 317-11.00A.

Pfizer Inc.: *See—*
Sarges, Reinhard, 3,864,351.

Phares, Thomas K., Sr. Leveling device having integral self-lock feature. 3,863,358, Cl. 33-367.000.

Pharmacia Aktiebolag: *See—*
Ryde, Emma Marta; and Ekstedt, Jan Erik, 3,863,633.

Phillips, David C.; and Melamed, Nathan T., to Westinghouse Electric Corporation. CO chemical laser from ketene gas. 3,864,646, Cl. 331-94.50G.

Phillips, Edward H., to Programmed Power, Inc. Stackable heat sink assembly. 3,864,607, Cl. 317-100.000.

Phillips, Melvin Richard. Speedclock. 3,864,552, Cl. 235-92.00T.

Phillips Petroleum Company: *See—*
Alquist, Henry E., 3,863,687.
Ayers, Buell O.; and Clardy, Edwin K., 3,863,489.
Bresson, Clarence R.; and Spaulding, Forrest D., 3,864,157.
Chapman, Charles C., 3,864,423.
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Physics International Company: *See—*
Godfrey, Charles S., 3,863,723.

Phywe Aktiengesellschaft: *See—*
Berkhan, Ernst, 3,864,212.

Picardat, Bernard, to Thomson-CSF. Display instrument using optical collimation. 3,864,025, Cl. 350-174.000.

Pichler, Englbert: *See—*
Adler, Klaus; Bauer, Johann; Englbrecht, Rupert; Turba, Werner; Pichler, Englbert; and Maluschka, Adolf, 3,864,432.

Pielemeier, John W.; and Weir, Robert M., to Whirlpool Corporation. Automatic washing machine and overflow tub ring therefor. 3,863,467, Cl. 68-18.00F.

Pierce, Edgar M. Method and apparatus for dewatering fibrous materials. 3,863,559, Cl. 100-37.000.
Pierce, Martha Murphy, executrix: *See—*
Kaercher, Ralph William; and Pierce, Stanley Wiswell, deceased, 3,863,373.
Pierce, Stanley Wiswell, deceased: *See—*
Kaercher, Ralph William; and Pierce, Stanley Wiswell, deceased, 3,863,373.
Pierre, Bernard; Volle, Rene; and Koerper, Raymond, to Etat Francais. Assemblies comprising an automatic firearm with a return spring mounted on a support. 3,863,542, Cl. 89-37.0GM.
Pierrot, Robert, to Thomson-CSF. Multifrequency operating radome. 3,864,690, Cl. 343-872.000.
Pierson, Fred W., Jr.: *See—*
Pierson, Fred W., Sr.; and Pierson, Fred W., Jr., 3,863,907.
Pierson, Fred W., Sr.; and Pierson, Fred W., Jr., to M & T Manufacturing Company. Radiant heating system. 3,863,907, Cl. 266-34.00R.
Pifer, Harry J. Surfing simulator. 3,863,915, Cl. 272-57.00B.
Pigeon, Michel: *See—*
Audenard, Bernard; Pigeon, Michel; and Stach, Claude, 3,864,638.
Pillet, Jean, to Rhone-Poulenc S.A. Implantable dental support. 3,863,344, Cl. 32-10.00A.
Pillnik, Burton Frank, to American Can Company. Full-open end with cambered tab. 3,863,801, Cl. 220-54.000.
Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See—*
Kan, Masao; Hyodo, Hiroshi; Matsuoka, Hirofusa; Watanabe, Akio; and Enami, Shigekazu, 3,864,275.
Pimentel, Daniel R.: *See—*
Hossfeld, Roderick J.; Tartaglia, Paul E.; and Pimentel, Daniel R., 3,864,031.
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Pipe Line Development Company, The: *See—*
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Pipeline Dehydrators, Inc.: *See—*
Powers, Marvin D., 3,864,102.
Pirnie, Robert M., Jr.; and Pirnie, Robert M., III, to Communication Equipment & Contracting Co., Inc. Telephone call distribution system with trunk indentification. 3,864,526, Cl. 179-27.0DB.
Pirnie, Robert M., III: *See—*
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Pirovano, Adele. Interchangeable conjugable element assembly for making up furnishing fittings. 3,863,874, Cl. 248-150.000.
Pissiotas, Georg: *See—*
Martin, Henry; Rohr, Otto; Duerr, Dieter; Janiak, Stefan; Pissiotas, Georg; and Toepfl, Werner, 3,864,395.
Pistor, Horst; Simmersbach, Edmund, deceased; by Mohler, Ingeborg, heiress; Schaller, Artur; and Knippschild, Gerd, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of alkali percarbonate. 3,864,454, Cl. 423-415.00P.
Pitel, Ira J.: *See—*
Spira, Joel S.; Licata, Joseph; Pitel, Ira J.; and Wenger, Lester E., 3,864,561.
Pitha, John J.; and Ellis, Howard F., to General Electric Company. Electrode for a granular electrical circuit element and method of making same. 3,864,658, Cl. 338-21.000.
Pitt, W. Wilson, Jr.: *See—*
Tiffany, Thomas O.; Mailen, James C.; Johnson, Wayne F.; Scott, Charles D.; and Pitt, W. Wilson, Jr., 3,864,089.
Pitzer, Emory W., to Phillips Petroleum Company. Tin-Phosphorus Oxidative Dehydrogenation Catalyst. 3,864,279, Cl. 252-435.000.
Plas/Steel Products, Inc.: *See—*
Shobert, Samuel M.; and Rice, Bernard L., 3,864,182.
Plastic Tubing, Inc.: *See—*
Maroschak, Ernest J., 3,864,446.
Platonov, Vladimir Nikiforovich: *See—*
Deordiev, Nikolai Trifonovich; Kononov, Ivan Vasilievich; Maslennikov, Ivan Egorovich; Modzheevsky, Gennady Vitalievich; Platonov, Vladimir Nikiforovich; and Sukhanov, Vasily Tikhonovich, 3,863,488.
Platt International Limited: *See—*
Cartlidge, Albert Joseph; and Shuttleworth, Frank, 3,863,311.
Platt, Stephen A., to Platt, Stephen A.; and Platt, Vernet B. Manual sound reproduction apparatus. 3,864,745, Cl. 360-96.000.
Platt, Vernet B.: *See—*
Platt, Stephen A., 3,864,745.
Plough, Russell H.: *See—*
Dagiel, Richard T.; and Plough, Russell H., 3,863,900.
Plumb, Edwin W.; and Meikis, Harold T., to Safeguard Manufacturing Co. Feed device. 3,863,487, Cl. 72-421.000.
Plyler, Robert G.; and Russo, Andrew, Jr., to General Motors Corporation. Printed circuit connector terminal. 3,864,007, Cl. 339-17.0LC.
PMD Entwicklungswerk fur Kunststoff-Maschinen GmbH & Co., K.G.: *See—*
Naumann, Wilhelm, 3,863,424.
Pocobello, Michael A.: *See—*
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Ponjee, Johannes Jacobus: *See—*
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Grosse, Peter; Ponsold, Kurt; Prousa, Richard; Schnabel, Ralf; and Von Zychlinski, Jutta, 3,864,365.
Popa, Ioan Pop D., to Institutul Pentru Creatie Stiintifica Si Technica. Thoracic drainage catheter. 3,863,641, Cl. 128-350.00R.
Pope, Bill J. Method For Vinyl Halides. 3,864,409, Cl. 260-656.00R.
Popeil, Samuel J., to Popul Brothers, Inc. Compactor. 3,863,563, Cl. 100-102.000.
Popowicz, Anthony M.: *See—*
Ishida, Takanobu; Popowicz, Anthony M.; and Glickstein, Joseph, 3,863,669.
Popp, Gottfried; Haebler, Wolfgang; and Gohrbandt, Wilhelm, to Bayer Aktiengesellschaft. Non-Aqueous Dyestuffs with a Phthalic Acid Dialkyl Ester. 3,864,077, Cl. 8-173.000.
Poppy Food Company: *See—*
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Popul Brothers, Inc.: *See—*
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Porret, Daniel; and Habermeier, Jurgen, to Ciba-Geigy Corporation. Acrylic Acid Esters Containing a N,N-Heterocyclic Ring. 3,864,357, Cl. 260-309.500.
Porret, Daniel; and Habermeier, Jurgen, to Ciba-Geigy Corporation. Epoxy-acrylic acid esters. 3,864,358, Cl. 260-309.500.
Postell, Alvin E.: *See—*
Day, Wallace; Postell, Alvin E.; and Postell, William D., 3,863,847.
Postell, William D.: *See—*
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Povarov, Leonard Sergeevich: *See—*
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PPG Industries, Inc.: *See—*
Graham, Roy R., 3,864,155.
Hoekje, Howard H.; and Welch, Cletus N., 3,864,457.
Shorr, Norman; and Littell, Harry E., Jr., 3,864,204.
Thomaswick, Ronald J.; and Rowley, James R., 3,863,799.
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Preload Technology, Inc.: *See—*
Closner, John J.; Marchaj, Tadeusz Josef; and Wichman, Sven Hjalmar, 3,863,408.
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Price, O. R. Plastic table tennis net bracket. 3,863,921, Cl. 273-30.000.
Price, Ralph E., to Landis Tool Company. Workpiece orienting device for a machine tool. 3,863,402, Cl. 51-216.0ND.
Price, Samuel T., to Enterprise Machine and Development Corporation. Yarn texturing air jet. 3,863,309, Cl. 28-1.400.
Priegnitz, James W.: *See—*
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Prodel, Ulrich Heinrich, to Spumalit-Anstalt. Plastic crate for transporting bottles in bottle carriers. 3,863,759, Cl. 206-203.000.

Programmed Power, Inc.: *See—*
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Guienne, Paul Francois; and Prouhet, Jacques Francois Robert. 3,863,589.
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Grosse, Peter; Ponsold, Kurt; Prousa, Richard; Schnabel, Ralf; and Von Zychlinski, Jutta, 3,864,365.
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Puckett, James E. Spark plug cleaner. 3,863,286, Cl. 15-104.01R.
Purdy, Paul J., to J. I. Case Company. Pressure compensated pump. 3,863,448, Cl. 60-422.000.
Purlia, John M. Illuminated fishing lure with line attachment. 3,863,380, Cl. 43-17.600.
Pyo, Hong Sung: *See—*
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Quenot, Michel, to Mabo, Stanley. Rigid measuring rod. 3,863,346, Cl. 33-88.000.
Quenot, Michel, to Mabo, Stanley. Case for a linear measuring device. 3,863,860, Cl. 242-84.800.
Quick, Donald J., to International Harvester Company. Drive mechanism for jib cranes. 3,863,406, Cl. 52-115.000.
R. A. Jones & Company, Inc.: *See—*
LaMers, Herbert, 3,863,761.
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Raabe, Thomas; Stachel, Adolf, deceased (by Stachel, Ingeburg Lydia Katharina, heiress); Scholtholt, Josef; and Nitz, Rolf-Eberhard, to Cassella Farbwerke Mainkur Aktiengesellschaft. 3-(Benzoyl)-2-(4'-aniline carbonyl or benzoxy-alkylpiperazins)-propionitriles. 3,864,344, Cl. 260-268.0CN.
Rabinovich, Meri Solomonovna; Povarov, Leonard Sergeevich; and Pavljuk, Galina Sergeevna. Method of preparing α-aminobenzlpenicillin. 3,864,332, Cl. 260-239.100.
Rackett, Gerald F.; and Sacks, Ralph. Continuous loop film cartridge and drive mechanism. 3,863,852, Cl. 242-55.19R.
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Rain Bird Sprinkler Mfg. Corporation: *See—*
Bumpstead, John G., 3,863,845.
Ramer, James L. Explosive actuated punch. 3,863,341, Cl. 30-358.000.
Ramqvist, Lars Henry; and Werme, Henrik, to Rederiaktiebolaget Nordstjernan; and AB Garphytte Bruk. Coating of a steel or iron with a chromium containing surface layer. 3,864,221, Cl. 204-38.00R.
Ramsey, Edward Lewis, Jr.; and Smith, Arnold Ray, to Bell Telephone Laboratories, Incorporated. Pedestal closure for buried cable. 3,864,510, Cl. 174-38.000.
Ranalli, Ralph; and Torrence, Kenneth R., to Rohe' Scientific Corporation. Ultrascope. 3,864,660, Cl. 340-1.00R.
Ranalli, Ralph, to Rohe' Scientific Corporation. Ultrascope. 3,864,661, Cl. 340-1.00R.
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Raudman, Charles J., Jr.; and Robertson, Clyde W., to Skyway Machine, Inc. Exhaust silencer for internal combustion engine. 3,863,733, Cl. 181-42.000.
Rausch, Richard E., to Universal Oil Products Company. Bimetallic Catalytic Reforming with Water Addition. 3,864,241, Cl. 208-139.000.
Ravitz, Benjamin D., to Lipsitz, Harold D., a part interest. Pressed metal scrap block and method of recovering scrap metal. 3,864,092, Cl. 29-186.000.
Ray-Chaudhuri, Dilip K.; and Iovine, Carmine P., to National Starch and Chemical Corporation. Process For The Preparation Of Bis-(2,3-Dibromopropyl) Phosphoryl Chloride. 3,864,436, Cl. 260-975.000.
Ray, Jimmy C., to Industrial Innovations, Inc. Safety portable radiant type electrical heater. 3,864,547, Cl. 219-343.000.
Ray, Lowell Elmo, to American Can Company. Labeled side-seamed can body. 3,863,374, Cl. 40-306.000.
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Stillwell, Elbert M., 3,863,282.
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RCA Corporation: *See—*
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Reaney, Albert; and Taylor, Michael, to Stanley Tools Limited. Retractable blade knife. 3,863,339, Cl. 30-162.000.
Recognition Equipment Incorporated: *See—*
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Reeber, Rudolf; Hofmeister, Peter; Strobl, Heinrich; and Muller, Johann, deceased (by Muller, Katharina, legal representative), to Friedrich Deckel Aktiengesellschaft. Engraving and copy milling machine having a pantograph. 3,863,544, Cl. 90-13.100.
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Regnier, Gilbert; Canevari, Roger; Poignant, Jean-Claude; and Duhault, Jacques, to "Science Union et Cie, Societe Francaise de Recherche Medical". 1-Oxa-3,8-diaza spiro (4,5) decane compounds. 3,864,348, Cl. 260-293.660.
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Reich, Elmar; and Kohle, Alfons, to Hans Lubberr. Rotary tower crane suitable for highway transportation. 3,863,773, Cl. 212-46.00B.
Reid, Donald E., to Hercules Incorporated. Stabilized Polyolefins useful as Wire Insulation in Petroleum-Jelly filled Cables. 3,864,431, Cl. 260-897.00R.
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Rein, Charles R., to United States of America, Navy. Underwater heat sink. 3,863,459, Cl. 62-48.000.
Reinhardt, Helmut; Trebinger, Karl; and Kallrath, Gottfried, to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler. Process for the production of alkali ferrocyanide. 3,864,453, Cl. 423-367.000.
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Reiser, Mario; Nook, Lothar; and Eidebenz, Emil, to Hoechst Aktiengesellschaft. Xanthines in pharmaceutical preparations and for stabilization of vitamins. 3,864,469, Cl. 424-22.000.
Reitz, Arnold B. Woodworking jig. 3,863,397, Cl. 51-131.000.
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Reynolds, Gordon S.; Pannier, Karl A., Jr.; and Sorenson, James L., to Sorenson Research Co., Inc. Aseptic suction system for body fluids and valve therefor. 3,863,634, Cl. 128-276.000.
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Rheinmetall G.m.b.H., Firma: *See—*
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Richards, Edward L.; and Dobrosielski, Stephen S., to Westinghouse Electric Corporation. Control switch assembly. 3,864,535, Cl. 200-281.000.
Richards, Kenneth. Pressure-type tablet hypochlorinating device. 3,864,090, Cl. 23-267.00E.
Richardson, Frederick Denys. Apparatus for measuring in a continuous manner oxygen in a molten metal. 3,864,231, Cl. 204-195.00S.
Richardson, John M.; and Reid, George W., to RSC Industries,Inc. Apparatus for treating sewage. 3,864,258, Cl. 210-85.000.
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Ries, Gordon E. Life support system and rebreather. 3,863,629, Cl. 128-142.000.
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Robinson, Bernie E.; and Sachs, Alfred L., to Milwaukee Valve Company, Inc. Gate valve. 3,863,889, Cl. 251-328.000.
Robinson, Glenn Clarke, to Dow Chemical Company, The. Solid epoxy resins from hydrogenated bisphenols and aromatic dicarboxylic acids. 3,864,316, Cl. 260-78.4EP.
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Rossetti, Louis F., Jr., to Electronized Chemicals Corporation. Moldable and heat recoverable composition comprising an admixture of vinylidene fluoride/hexafluoropropylene copolymer and a polymer of vinylidene fluoride. 3,864,228, Cl. 204-159.200.
Rossi, Anthony T. Flap opening mechanism for high speed automatic casing machine. 3,863,427, Cl. 53-382.000.
Rossi, Roberto, to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C. Device for controlling the approach speed in machine tools particularly grinding machines. 3,863,400, Cl. 51-165.770.
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Saiki, Kazuyoshi; Nomaguchi, Kaneyoshi; Yoshizue, Keiro; and Nagoya, Tsutomu, to Sankyo Chemical Industries Ltd.; and Tokyo Buhin Kogyo Company Ltd. Method of manufacturing friction members of the thermosetting resin type. 3,864,303, Cl. 260-38.000.
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Sakwa, Waclaw; Jura, Stanislaw; and Labecki, Mariusz. Process of Producing Manganese Cast Steel on High Impact Strength. 3,864,123, Cl. 75-129.000.
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Scarborough, William M.; and Wilcox, Doyle E. Accelerometer. 3,863,508, Cl. 73-516.00R.
Scerbo, Louis Joseph; and Wood, William Wallace, Jr., to Bell Telephone Laboratories, Incorporated. Inertial orbital vibrating plow apparatus. 3,863,721, Cl. 172-40.000.
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Schmidt, Matthias. Honeycomb structure for use in bee breeding. 3,864,196, Cl. 161-68.000.

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Schneider, Arthur, to Rollei-Werke Franke & Heidecke. Electronic flash device. 3,864,601, Cl. 315-241.00P.

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Schneider, Thomas E., deceased: *See—*
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Schneider, Thomas R., administrator: *See—*
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Schnettler, Roland R. M., to Maschinenfabrik Sack GmbH. Drive unit for continuously operating sheet processing or treating lines. 3,863,513, Cl. 74-221.000.

Schober, Manfred, to du Pont de Nemours, E. I., and Company. Photographic activating bath. 3,864,129, Cl. 96-50.00R.

Schoberl, Werner, to Licentia Patent-Verwaltungs-G.m.b.H. Semiconductor device. 3,864,727, Cl. 357-65.000.

Schoenfelder, James L., to Iowa State University Research Foundation, Inc. Solar wall system. 3,863,621, Cl. 126-270.000.

Scholes, Ian Robert: *See—*
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Scholz, Hans, to English Electric Valve Company Limited. Vidicon having mesh on end of cylinder coaxial with anode. 3,864,585, Cl. 313-390.000.

Scholz, Norbert, to Volkswagenwerk Aktiengesellschaft. Butterfly valve arrangement for a combustion engine having external ignition. 3,863,618, Cl. 123-198.0DC.

Schott, Cornelis Johannes; Ponjee, Johannes Jacobus; Van Doorn, Rudolf Alexander; and Bolwijn, Pieter Tammo, to U.S. Philips Corporation. Matrix picture display device using liquid that is reversibly reducible and oxidisable by electric current. 3,864,589, Cl. 313-232.000.

Schrader, Gerhard; and Lurssen, Klaus, to Bayer Aktiengesellschaft. 4-Substituted 1,2-methylene dioxybenzene compounds as plant growth regulants. 3,864,115, Cl. 71-88.000.

Schreck, Harold J.: *See—*
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Schreiner, Horst; and Rothkegel, Bernard, to Siemens Aktiengesellschaft. Powder metallurgy method for making an electric contact and the resulting contact. 3,863,337, Cl. 29-630.00C.

Schroeder, Eugene Nelson, to International Business Machines Corporation. Method and apparatus for printing code patterns by nonimpact means. 3,864,691, Cl. 346-74.100.

Schror, Friedrich: *See—*
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Schultz, Everett M.; and Cragoe, Edward J., Jr., to Merck & Co., Inc. Substituted 2-aminomethyl-4,6-dihalophenols. 3,864,401, Cl. 260-570.900.

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Schulz, Wolfgang W.; and King, William H., Jr., to Exxon Research and Engineering Company. Quartz crystal solute mass detector. 3,863,495, Cl. 73-61.10C.

Schumacher, Charles R.; Dominguez, Ezekiel; and Crouch, Gordon H., to Bethlehem Steel Corporation. Method for producing manganese oxide pellets. 3,864,118, Cl. 75-3.000.

Schutt, Hans U., to Shell Oil Company. Hydrocarbon conversion catalyst. 3,864,283, Cl. 252-455.00Z.

Schwanauer, Francis J.: *See—*
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Schwartz, Boris. Intracorporeal catheter assembly. 3,863,632, Cl. 128-221.000.

Schwartz, George F., to United States Steel Corporation. Crane hoist height control. 3,863,772, Cl. 212-21.000.

Schwarz, Theodore A., to International Business Machines Corporation. Servo channel equalization network. 3,864,741, Cl. 360-77.000.

Schwarzkopf, Henry; and Bouvier, John J., to Ferro Corporation. Diamond abrasive cut-off wheel. 3,863,401, Cl. 51-206.400.

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Seibert, Walter. Production of aryl-(4,4'-bis-(dialkylamino)-benzhydryl)-sulfones. 3,864,400, Cl. 260-570.00D.

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Seki, Hiromitsu; and Yamamoto, Kenji, to Yamamoto Kaguku Gosei Kabushiki Kaisha. Pressure sensitive copying paper. 3,864,145, Cl. 117-36.200.

Sekiguchi, Hideto; Tsutsui, Nobuhiro; and Sumi, Takehiko, to Japan Exlan Company Limited. Method of producing acrylic composite fibers. 3,864,447, Cl. 264-168.000.

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Shank, Herbert C., Jr., to Anchor Hocking Corporation. Chuck apparatus for supporting containers by the finish portion thereof. 3,863,753, Cl. 198-179.000.

Shapiro, Justin Joel; and Chin, John W. G., to said Shapiro. Liquid dispensing and transfer device. 3,863,807, Cl. 222-43.000.

Shapiro, Justin Joel: *See—*
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Shattuck, Richard E.: *See—*
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Shobert, Samuel M. Plastic bearing. 3,864,197, Cl. 161-96.000.

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Sickels, Nancy E. Leg-supporting g-and-retaining device attachable to an elevatable legrest of a wheel chair. 3,863,984, Cl. 297-427.000.

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Simpson, Arthur Raymond: *See—*
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Sindelar, Emmett F., to Warner & Swasey Company, The. Interpolator for machine tool control. 3,864,557, Cl. 235-151.110.

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Skyway Machine, Inc.: *See—*
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Smith, Fred T., to Sargent Industries, Inc. Noise reduction apparatus and method. 3,864,059, Cl. 417-20.000.

Smith, Geoffrey, to Nim-Cor Inc. Leaf-type expansible shaft with trapper bar. 3,863,857, Cl. 242-72.00B.

Smith, Howard A.; and Renick, William E., to ESB Incorporated. Charge control means for motive power battery charger. 3,864,617, Cl. 320-23.000.

Smith, Norval F., to Communicators, Inc., The. Film trim bin. 3,863,370, Cl. 40-106.100.

Smith, Richard K. Dentrifice applicator method. 3,863,655, Cl. 132-91.000.

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Smyth, Derek George, to National Research Development Corporation. (N^{A1},N^{B1},N^{B22}, carbamoyl)-(O^{A14},O^{B10},O^{B26}aryl) insulin derivatives. 3,864,325, Cl. 260-112.700.

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Sohn, Olaf C.; and Sohn, Adolph M. Web lock and tightener. 3,863,298, Cl. 24-68.00E.

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Sorenson Research Co., Inc.: *See—*
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Souslin, Richard Ervin; Klansnic, James E.; and Kahler, Charles, to Boeing Company, The. Thrust control apparatus for a jet propulsion engine and actuating mechanism therefor. 3,863,867, Cl. 244-12.00D.

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Spence, Larry W.: *See—*
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Sperberg, Lawrence R. Mini-ply improved pneumatic tires. 3,863,696, Cl. 152-356.000.

Sperry Rand Corporation: *See—*
Herdman, Craig T.; and Jacobson, Peter E., 3,864,748.
Strenglein, Harry F., 3,864,633.
van de Vaart, Herman; Matthews, Hugh B.; and Worley, James C., 3,863,497.

Sperry Rand Limited: *See—*
Maxwell, David James; and Towner, Frank Richard, 3,864,737.

Spiegel, Jacob; and Miller, Albert, to Gilbreth Company, by said Miller. Cardless head board merchandising package. 3,863,837, Cl. 229-87.00R.

Spinnett, Raymond G. Rotary converters having specialized interleaving elements. 3,863,610, Cl. 123-8.270.

Spira, Joel S.; Licata, Joseph; Pitel, Ira J.; and Wenger, Lester E., to Lutron Electronics Co., Inc. Dimmer switch with illuminated knob. 3,864,561, Cl. 240-2.0SP.

Spitzer, Robert, to du Pont de Nemours, E. I., and Company. Process for electrolyzing aqueous sodium or potassium ion solutions. 3,864,226, Cl. 204-98.000.

Spivack, Mark A.: *See—*
Loeb, William E.; and Spivack, Mark A., 3,864,202.

Spohr, Guenter; and Sparham, Vaughan R., to Hendrick Manufacturing Company. Apparatus for the tertiary treatment of liquids. 3,864,264, Cl. 210-199.000.

Springer, Willard J.; and Baker, Bruce A., Jr., to Kaiser Aluminum & Chemical Corporation. Pretreating and Electrocoating Metal Products. 3,864,230, Cl. 204-181.000.

Spumalit-Anstalt: *See—*
Prodel, Ulrich Heinrich, 3,863,759.

Squire, Christopher John: *See—*
Le Count, David J.; and Squire, Christopher John, 3,864,390.

Staal, Gerardus B.: *See—*
Henrick, Clive A.; and Staal, Gerardus B., 3,864,376.

Staar, Marcel Jules Helene. Arrangement for playing recording on an endless tape in cartridges of different types. 3,864,743, Cl. 360-94.000.

Stach, Claude: *See—*
Audenard, Bernard; Pigeon, Michel; and Stach, Claude, 3,864,638.

Stachel, Adolf, deceased: *See—*
Raabe, Thomas; Stachel, Adolf, deceased; Scholtholt, Josef; and Nitz, Rolf-Eberhard, 3,864,344.

Stachel, Ingeburg Lydia Katharina, heiress: *See—*
Raabe, Thomas; Stachel, Adolf, deceased; Scholtholt, Josef; and Nitz, Rolf-Eberhard, 3,864,344.

Stackman, Robert W.; and Vogt, Clifford M., to Celanese Corporation. Dry-spinning tetrachlorinated armoatic polyester filaments from methylene chloride solutions. 3,864,448, Cl. 264-205.000.

Staffe, Adolf; and Gerlach, Klaus, to Bayer Aktiengesellschaft. Acylated perfluoroalkanesulphonamides. 3,864,396, Cl. 260-556.00F.

Stalder, Fritz, to Oppliger, Ulrich, a part interest. Piece of furniture for a right-angled corner of a room. 3,863,279, Cl. 5-8.000.

Stalter, Neil J., to du Pont de Nemours, E. I., and Company. Stabilized acidic hydrogen peroxide solutions. 3,864,271, Cl. 252-99.000.

Stamco Division, The Monarch Machine Tool Company: *See—*
Huelsman, Charles E., 3,863,537.

Standard Oil Company: *See—*
Culbertson, George S.; and Karll, Robert E., 3,864,268.
Hughes, Robert D.; and Steigelmann, Edward F., 3,864,418.

Standard Pressed Steel Co.: *See—*
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Stanley Tools Limited: *See—*
Reaney, Albert; and Taylor, Michael, 3,863,339.
Stansell, Alpheus F., to Burroughs Corporation. Actuated spring mechanism for positioning magnetic heads. 3,864,749, Cl. 360-103.000.
Stapleton, Dale Cliffton: *See—*
Buckley, Lawrence Webb; Daniels, Raymond Alex; Froula, James Dewayne; Knight, Arthur Holt; Stapleton, Dale Cliffton; and Williams, George Thomas, 3,863,603.
Starling, James G.; and Mathes, Harold A., to Caterpillar Tractor Company. Hydraulic safety system for a vehicle transmission. 3,863,523, Cl. 74-754.000.
Stauffer Chemical Company: *See—*
Grindstaff, Donald A.; and Ahern, William P., 3,864,506.
Pallos, Ferenc M., 3,864,334.
Via, Francis A.; Uhing, Eugene H.; and Toy, Arthur D. F., 3,864,394.
Weil, Edward D., 3,864,156.
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Stedman, Robert N.: *See—*
Gee, James E.; and Stedman, Robert N., 3,863,367.
Steenolsen, Ken, to Poppy Food Company. Method of packaging self-basting poultry. 3,864,503, Cl. 426-232.000.
Steever, Andrew B.; and Kelleher, David, to Dorr-Oliver Incorporated. Fluidized bed reactor. 3,863,577, Cl. 110-8.00R.
Steigelmann, Edward F.: *See—*
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Stein, Herman Hal; and Prasad, Raj Nandan, to Abbott Laboratories. Adenosine-5'-carboxylic acid amides. 3,864,483, Cl. 424-180.000.
Stephanek, William D.: *See—*
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Sterne, Frank: *See—*
Cahnman, Hugo N.; Sterne, Frank; and Canfield, Douglas M., 3,864,546.
Stevenson, Charles F., to Rinn Corporation. Position indicating device for dental x-ray machines. 3,864,576, Cl. 250-505.000.
Stewart-Warner Corporation: *See—*
Brehmer, John; Brewer, Russell C.; and Robinson, John W., 3,863,903.
Tramontini, Vernon N., 3,863,713.
Stievenari, Emile; and Muller, Jurgen, to Agfa-Gevaert Aktiengesellschaft. Sheet drying apparatus. 3,863,360, Cl. 34-155.000.
Stiles, Alvin B. Process for the economical use of refractory reducing gases for the reduction of sulfur dioxide. 3,864,459, Cl. 423-564.000.
Stilling, Johann. Sign box with closure. 3,863,372, Cl. 40-132.00R.
Stillman, Irving M.; Trowe, Neil M.; and Clemens, Jules R., to Wheeler International, Inc. Method and Apparatus for Automatically, Identifying and Counting Various Cells in Body Fluids. 3,864,571, Cl. 250-302.000.
Stillman, Neil W.; and Osgood, Edmond R., to Diamond Shamrock Corporation. Stereospecific hydrogenation process using unsupported RuO_2 catalyst. 3,864,361, Cl. 260-326.800.
Stillwell, Elbert M., to Raymond Lee Organization, Inc., The, a part interest. Support bar for beds. 3,863,282, Cl. 5-317.00B.
Stockman, Richard F., to Air Preheater Company Inc., The. Ram type refuse loader. 3,863,779, Cl. 214-23.000.
Stone, Richard D., to Universal Oil Products Company. Integration of a reaction system having gravity-flowing catalyst particles with a fixed-bed system. 3,864,240, Cl. 208-64.000.
Storage Disk Corporation: *See—*
Applequist, Roy, 3,864,750.
Pejcha, Ivan, 3,864,747.
Storm, John G. Pouring spout attachment. 3,863,819, Cl. 222-569.000.
Stoy, Artur, to Ceskoslovenska akademie ved. Method of manufacturing polycoagulants. 3,864,323, Cl. 260-88.70R.
Stradella, Guiseppe; Gatti, Fernando; Daniele, Giuliano; and Strdella, Umberto. Pneumatically-servocontrolled, instantly-responsive floating valve, particularly adapted for underwater pneumatic guns and other uses. 3,863,887, Cl. 251-25.000.
Straile, Fritz; Eming, Winfried; and Kolb, Wolfgang, to Liquid Gas Anlagen Union GmbH. Device for the storage and transport of liquified gases, liquids and the like, in particular on ships. 3,863,460, Cl. 62-54.000.
Strauch, Kurt: *See—*
Galleithner, Hans; and Strauch, Kurt, 3,864,189.
Strdella, Umberto: *See—*
Stradella, Guiseppe; Gatti, Fernando; Daniele, Giuliano; and Strdella, Umberto, 3,863,887.
Streich, Steven G., to Halliburton Company. Cementing plug release assist apparatus. 3,863,716, Cl. 166-70.000.
Streliszky, Janos: *See—*
Feuer, Laszlo; Nogradi, Mihaly; Gottsegen, Agnes; Vermes, Borbala; Streliszky, Janos; Wolfner, Andras; Farkas, Lorant; Antus, Sandor; Kovacs, Maria; and Toth, Nee, 3,864,362.
Strenglein, Harry F., to Sperry Rand Corporation. Angle diversity communication system. 3,864,633, Cl. 325-304.000.
Strepparola, Ezio: *See—*
Caporiccio, Gerardo; and Strepparola, Ezio, 3,864,318.
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Suganuma, Tetsuya: *See—*
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Sugaya, Koichi: *See—*
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Sugiura, Fumio: *See—*
Suzuki, Ichiro; and Sugiura, Fumio, 3,863,731.
Sugiyama, Takahiro; and Oishi, Michiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Light measuring optical system for use in a reflex camera. 3,864,702, Cl. 354-56.000.
Sugiyama, Takashi; Odajima, Minoru; and Tamezumi, Yoshiro, to Yokogawa Electric Works Limited. Standard voltage generating circuit. 3,864,624, Cl. 323-19.000.
Sukhanov, Vasily Tikhonovich: *See—*
Deordiev, Nikolai Trifonovich; Kononov, Ivan Vasilievich; Maslennikov, Ivan Egorovich; Modzheevsky, Gennady Vitalievich; Platonov, Vladimir Nikiforovich; and Sukhanov, Vasily Tikhonovich, 3,863,488.
Sulkowski, Theodore S.; and Mascitti, Albert A., to American Home Products Corporation. N-(2-[3-hydroxy-3-phenyl-2-phthalimidinyl]-ethyl)-sulfonamides. 3,864,360, Cl. 260-325.0PH.
Sullivan, David P.: *See—*
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Sundby, Bjorn; Kenney, Edward J.; and Wixon, Harold E., to Colgate-Palmolive Company. N-(2-Hydroxyhydrocarbyl) Iminodicarboxylates. 3,864,389, Cl. 260-501.110.
Sundstrand Corporation: *See—*
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Suomen Sokeri Osakeyhtio (Finnish Sugar Company): *See—*
Melaja, Asko J.; and Hamalainen, Lauri, 3,864,406.
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Susman, Samuel Eugene, to American Cyanamid Company. Latent curing agent for isocyanate terminated prepolymers. 3,864,313, Cl. 260-75.0NC.
Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; Takano, Koichi; and Yoshikawa, Kiyoshi, to Lion Fat and Oil Co., Ltd. Thermoplastic resins loaded with filler bonded to cover layers. 3,864,201, Cl. 161-160.000.
Suzuki, Ichiro; and Sugiura, Fumio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Instrument panel supporting construction of vehicles. 3,863,731, Cl. 180-90.000.
Suzuki, Mamoru; Hirata, Eiichi; and Taziri, Sigenori, to Sumitomo Chemical Company, Limited. Process for Producing a Cationic Carbamoyl Polymer Prepared by Aminoalkylation of Carbamoyl Polymer in Mixture of Water and Water-Miscible Organic Solvent. 3,864,312, Cl. 260-67.500.
Suzuki, Shigeru, to Nigata Engineering Co., Ltd. Diffused aeration pipe apparatus for use with an aeration tank. 3,864,441, Cl. 261-122.000.
Suzuki, Shinichi: *See—*
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Suzuki, Yasushi; and Tsukamoto, Kunio, to Teikoku Hormone Mfg. Co., Ltd. Process for the preparation of acylamino alkanol derivatives. 3,864,398, Cl. 260-562.00A.
Svenska Rotor Maskiner Aktiebolag: *See—*
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Svensson, Emil L., to Westinghouse Electric Corporation. Protection system for an image tube. 3,864,594, Cl. 315-10.000.

Svoboda, Petr; Vaisarova, Vera; Capka, Martin; Hetflejs, Jiri; Kraus, Milos; and Bazant, Vladimir, to Ceskoslovenska akademi ved. Process for the production of unsaturated organosilicon compounds. 3,864,372, Cl. 260-448.20E.

Swanson, Colin John, to ISC Alloys Limited. Moulding of superplastic alloy sheet. 3,864,176, Cl. 148-11.50R.

Swanson, Gunnar E., to Nielsen Hardware Corporation, The. Catch assembly. 3,863,966, Cl. 292-87.000.

Swanson, Roger, to Babson Brothers Company. Solids separation system. 3,864,255, Cl. 210-67.000.

Swanson, Ronald W.; Kerr, Edwin R.; and Smolin, William, to Texaco Inc. Purification of secondary alkyl amines. 3,864,402, Cl. 260-583.00N.

Swatman, Donald R., to Den-Tal-Ez Mfg. Co. Vacuum handpiece including integral vacuum valve. 3,863,635, Cl. 128-276.000.

Swered, Paul: *See—*
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Swett, James B.; and Daenen, Robert H. C. M., to Dart Industries Inc. Storage Container For Meat Or Poultry Products. 3,863,833, Cl. 229-43.000.

Sygnator, Henry Anton, to Illinois Tool Works Inc. Method of forming a die section. 3,863,526, Cl. 76-107.00R.

Symons Corporation: *See—*
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Gregory, R. Kirk; and Dagiel, Richard T., 3,863,878.
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Synthelabo: *See—*
Cavallo, Roger Paul Charles, 3,863,630.

Syohji, Keisuke, to Shin-Shirasuna Electric Corporation; and Shin-Shirasuna Electric Corporation. Magnetic recording-reproducing device. 3,863,865, Cl. 242-209.000.

Syohji, Keisuke, to Shin-Shirasuna Electric Corporation. Tape recording and reproducing apparatus with a mechanism for changing over the electrical characteristics of the apparatus. 3,864,738, Cl. 360-69.000.

Szabo, Andras I.: *See—*
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Szabo, Zoltan; and Hirschberg, Frigyes, to Komplex Nagyberendezesek Export Import Vallalata. Process to Produce High Concentration Tomato Puree by Transforming Colloids. 3,864,504, Cl. 426-373.000.

Szarka Enterprises, Inc.: *See—*
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Szarka, Joseph R.: *See—*
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Szarka, Paul J.; and Szarka, Joseph R., to Szarka Enterprises, Inc. Vehicular supporting deck for a railroad grade crossing. 3,863,840, Cl. 238-8.000.

Tada, Osamu: *See—*
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Taggart, Robert B.; and Barth, Richard H., to Hewlett-Packard Company. Miniature flexible rotatable shaft coupler. 3,863,464, Cl. 64-11.00R.

Taguchi, Gyoto: *See—*
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Taiheiyo Coal Mining Co., Ltd.: *See—*
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Taira, Yasushi: *See—*
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Takahashi, Yukio, to Ikegai Tekko Kabushiki Kaisha. Strapping machine. 3,863,557, Cl. 100-33.0PB.

Takahasi, Masahiro: *See—*
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Takahata, Koichiro; and Shiba, Hiroshi, to Nippon Electric Company, Limited. Method of fabricating a semiconductor device. 3,864,217, Cl. 204-15.000.

Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Method and related apparatus for forming an element-free gap in a continuous slide fastener chain. 3,863,323, Cl. 29-408.000.

Takano, Koichi: *See—*
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Takeyama, Tetsu; Endoh, Ryoh; and Masuda, Keizo, to Toray Industries, Inc. Process for removing nitrogen oxides from gaseous mixtures. 3,864,450, Cl. 423-239.000.

Takiura, Mamoru; Ebisawa, Yasushi; and Kikuchi, Noriyuki, to Ikegai Tekko Kabushiki Kaisha. Apparatus for cross-linking molding of high polymers. 3,864,069, Cl. 425-204.000.

Tamai, Yasuo, to Xerox Corporation. Electrophotographic method of making an imaging master. 3,864,125, Cl. 96-1.0LY.

Tamezumi, Yoshiro: *See—*
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Tamura, Sadao, to Yokogawa Electric Works Limited. Recording instruments. 3,864,694, Cl. 346-136.000.

Tanaka, Katsuhide: *See—*
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Tanaka, Mitsugu; Hayashi, Katsumi; and Arai, Atsuaki, to Fuji Photo Film Co., Ltd. Developer for silver salt diffusion transfer photography. 3,864,131, Cl. 96-66.00R.

Tanaka, Shinya; Nakamura, Mantaro; and Hirose, Kazuo, to Sanken Electric Company Limited. DC to AC inverter with thyristor for isolating load circuit from commuting reactor. 3,864,619, Cl. 321-16.000.

Tanaka, Takashi; and Suzuki, Shinichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Blend of polyvinyl chloride resins with mercaptan-modified MBS resins. 3,864,429, Cl. 260-876.00R.

Tanaka, Yoshiaki: *See—*
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Tanigawa, Shogo; and Yokoyama, Takesi, to Mitsui Shipbuilding and Engineering Co., Ltd. Gas-liquid contacting apparatus. 3,864,439, Cl. 261-114.00R.

Taniguchi, Hiroshi; and Tanimoto, Tatuo, to Kobe Steel, Ltd. Hob. 3,863,317, Cl. 29-103.00B.

Taniguchi, Yoshiko: *See—*
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Tarsha, Manuel A., to Parker-Hannifin Corporation. Piston type accumulator. 3,863,676, Cl. 138-31.000.

Tarsha, Manuel A., to Parker-Hannifin Corporation. Accumulator with combination guide and seal ring. 3,863,677, Cl. 138-31.000.

Tartaglia, Paul E.: *See—*
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Tassone, Joseph V.; and Candor, James T. Baseball and softball type ball tee. 3,863,920, Cl. 273-25.000.

Tatsukami, Yoshiharu; Futami, Takashi; and Oda, Yasuhiro, to Sumitomo Chemical Company, Limited; and Daikin Kogyo Co., Ltd. Cured Rubber composition Compising EPR or EPDM and a Fluorine Containing Ethylenepolymer. 3,864,433, Cl. 260-897.00C.

Taylor, Michael: *See—*
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Taylor, Robert W.: *See—*
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Tenneco Inc.: *See—*
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Tessmann, Ottomar: *See—*
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Swanson, Ronald W.; Kerr, Edwin R.; and Smolin, William, 3,864,402.
Texas Instruments Incorporated: *See—*
Cragon, Harvey George, 3,864,550.
Evans, Thomas E., 3,864,650.
Fiore, Peter O., 3,864,537.
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Hossfeld, Roderick J.; Tartaglia, Paul E.; and Pimentel, Daniel R., 3,864,031.
Lackey, Robert P., 3,864,578.
Textronix, Inc.: *See—*
Bruns, Andrew Reiner, 3,864,709.
Thelen, Donald J.: *See—*
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Theriot, Gerold F.; and Hoofnagle, Frank M., to B.W.B. Controls, Inc. Dual action pilot. 3,863,672, Cl. 137-596.180.
Thermo Electron Corporation: *See—*
Bornhorst, Walter J., 3,863,663.
Gunther, Bernd, 3,863,498.
Thermo King Corporation: *See—*
Brown, Ronald W., 3,864,657.
Theron, Helgard Holtzhauzen. Centrifugal pump. 3,864,057, Cl. 415-199.000.
Thien, Gerhard; and Fachbach, Heinz, to Hans List. Internal combustion engine with sound-proof v-belt pulley. 3,863,617, Cl. 123-195.00C.
Thomas and Betts Corporation: *See—*
Levy, Sidney, 3,864,013.
Thomas, DeWayne James, to Intertherm, Inc. Slide-on base-to-plenum assembly. 3,863,962, Cl. 285-325.000.
Thomas, Geary L.; Kostanty, Raymond G.; and San Julian, David, to Bendix Corporation, The. Annunciator for an electrical system including built-in test equipment. 3,864,673, Cl. 340-214.000.
Thomas, Johann, to Siemens Aktiengesellschaft. Power supply for high speed vehicles. 3,863,574, Cl. 104-148.0LM.
Thomas, Michael D. Holding mechanism for tape cartridge. 3,864,050, Cl. 403-329.000.
Thomas, Paul M. System for lifting and handling panels. 3,863,972, Cl. 294-74.000.
Thomas, Robert, to E. R. Squibb & Sons, Inc. Substituted 1 H-oxazolo(4,3-C)(1,4)thiazinium. 3,864,339, Cl. 260-243.00R.
Thomaswick, Ronald J.; and Rowley, James R., to PPG Industries, Inc. Adjustable bin for transporting articles. 3,863,799, Cl. 220-1.500.
Thompson, Darrell R., to du Pont de Nemours, E. I., and Company. Addition polymers with polyethylenimine terminal groups. 3,864,379, Cl. 260-465.400.
Thompson, Edwin C., to Western Electric Company, Incorporated. Method and apparatus for adjusting resonators formed on a piezoelectric wafer. 3,864,161, Cl. 117-212.000.
Thompson, Garth N.: *See—*
Bodycomb, Alistair K.; Meiel, Samuel P.; Shebry, Cameron W.; and Thompson, Garth N., 3,863,412.
Thompson, Herbert E., to Shugart Associates, Inc. Magnetic head assembly having a slotted body portion of elastic material for clamping a transducer and method of manufacture therefor. 3,864,752, Cl. 360-121.000.
Thompson, Raymond F.: *See—*
Handman, Lawrence M.; Spangler, Charles E.; and Thompson, Raymond F., 3,864,232.
Thompson, Robert G.; and Gund, Heinz K., to Briggs Stratton Corporation. Thermostatic automatic choke control for small engines. 3,863,614, Cl. 123-119.00F.
Thoms, William C.: *See—*
Bakermans, Fransiscus C.; and Thoms, William C., 3,864,008.
Thomson-CSF: *See—*
Picardat, Bernard, 3,864,025.
Pierrot, Robert, 3,864,690.
Trotel, Jacques, 3,864,597.
Thuillier, Yvonne; and Perrault, Marcel Antoine, to Albert Rolland S.A. Compositions. 3,864,477, Cl. 424-94.000.
Tien, Ping King: *See—*
Smolinsky, Gerald; and Tien, Ping King, 3,864,019.
Tiffany, Thomas O.; Mailen, James C.; Johnson, Wayne F.; Scott, Charles D.; and Pitt, W. Wilson, Jr., to United States of America, Atomic Energy Commission. Multiple-sample rotor assembly for blood fraction preparation. 3,864,089, Cl. 23-258.500.
Timex Corporation: *See—*
Barth, Mandred Hans; Sedlak, Adolf; and Sodler, Walter E., 3,863,437.
Keeler, Eugene R., 3,864,582.
Schwarzschild, Jack; and Boxberger, Raymond Robert, 3,863,436.
Timmerman, Daniel Maurice; and De Winter, Walter Frans, to Agfa-Gevaert. Recording material. 3,864,158, Cl. 117-201.000.
Titov, Dmitry Vladimirovich; Makachev, Nikolai Ivanovich; Sidorov, Jury Pavlovich; Filatova, Tatyana Konstantinovna; Butuzov, Alexei Vasilievich; Selivanov, Anatoly Grigorievich; and Dyachkov, Alexandr Mikhailovich. Beating-up device for looms. 3,863,680, Cl. 139-12.000.
Tittman, Jay, to Schlumberger Technology Corporation. Well logging processing method and apparatus. 3,864,569, Cl. 250-264.000.
Toback, Henry, to General Battery Corporation. Method and apparatus for inverting operations associated with the assembly of a storage battery. 3,863,775, Cl. 214-1.0QE.
Tobiki, Hisao; Shimago, Kozo; Okano, Shigeru; Komatsu, Toshiaki; Katsura, Toyozo; Taira, Yasushi; and Eda, Yasuko, to Sumitomo Chemical Company, Limited. Penicillins substituted with heterocyclic groups. 3,864,329, Cl. 260-239.100.
Toburen, Delmar: *See—*
Chaffee, Robert C.; and Toburen, Delmar, 3,863,815.
Todd, William H. Universal hose coupling. 3,863,958, Cl. 285-12.000.
Toepfl, Werner: *See—*
Martin, Henry; Rohr, Otto; Duerr, Dieter; Janiak, Stefan; Pissiotas, Georg; and Toepfl, Werner, 3,864,395.
Tokuno, Masateru, to Rengo Co., Ltd. Apparatus for splicing paper rolls. 3,863,854, Cl. 242-58.200.
Tokyo Boshi Kabushiki Kaisha: *See—*
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Tokyo Buhin Kogyo Company Ltd.: *See—*
Saiki, Kazuyoshi; Nomaguchi, Kaneyoshi; Yoshizue, Keiro; and Nagoya, Tsutomu, 3,864,303.
Tokyo Shibaura Electric Co., Ltd.: *See—*
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Kameoka, Akio; Kuriyagawa, Mamoru; and Nakamura, Shinichi, 3,864,516.
Mori, Kenichi; Nakayama, Naoto; and Osawa, Takeshi, 3,864,559.
Toma, Khairy; and Hassapis, Thomas J., to Armour-Dial, Inc. Process for making translucent soap bars. 3,864,272, Cl. 252-125.000.
Tomkin, Douglas Frazer: *See—*
Agnew, Kenneth Malcolm; Coward, Timothy; and Tomkin, Douglas Frazer, 3,863,276.
Tomoda, Masayasu: *See—*
Kometani, Yutaka; Koizumi, Shun; Suzuki, Takeshi; Furukawa, Yasuyoshi; Tomoda, Masayasu; and Kondo, Kiyoichi, 3,864,298.
Tong, Long S., to Westinghouse Electric Corporation. Inlet flow oscillation damper for a nuclear reactor. 3,864,209, Cl. 176-50.000.
Tooker, Howard A.: *See—*
Myslinski, Stephen A.; Pritchard, Edwin J.; and Tooker, Howard A., 3,863,764.
Topping, Robert, to Knox, James Henry. Intercommunication system using controlled gates. 3,864,527, Cl. 179-38.000.
Toray Industries, Inc.: *See—*
Takeyama, Tetsu; Endoh, Ryoh; and Masuda, Keizo, 3,864,450.
Torgow, Abraham M. Whiptop game. 3,863,925, Cl. 273-110.000.
Torii, Kenichi: *See—*
Fukuda, Takeo; Torii, Kenichi; and Nishibayashi, Kazuo, 3,864,636.
Torrence, Kenneth R.: *See—*
Ranalli, Ralph; and Torrence, Kenneth R., 3,864,660.
Torrington Company, The: *See—*
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Tosic, Milorad. Folding bed. 3,863,281, Cl. 5-136.000.
Toth, Joseph W.: *See—*
Mattox, Douglas M.; and Toth, Joseph W., 3,864,112.
Toth, Nee: *See—*
Feuer, Laszlo; Nogradi, Mihaly; Gottsegen, Agnes; Vermes, Borbala; Streliszky, Janos; Wolfner, Andras; Farkas, Lorant; Antus, Sandor; Kovacs, Maria; and Toth, Nee, 3,864,362.
Tovarys, Zdenek, to Vitkovicke zelezarny Klementa Gottwalda narodni podnik. Arrangement for binding together packs of elongated objects such as rods and similar articles by a self-sticking band. 3,864,191, Cl. 156-468.000.
Towner, Frank Richard: *See—*
Maxwell, David James; and Towner, Frank Richard, 3,864,737.
Townsend Engineering Company: *See—*
Townsend, Ray T., 3,863,556.
Townsend, Ray T., to Townsend Engineering Company. Machine for injecting fluids into meat products. 3,863,556, Cl. 99-487.000.
Toy, Arthur D. F.: *See—*
Via, Francis A.; Uhing, Eugene H.; and Toy, Arthur D. F., 3,864,394.
Toyama Chemical Co., Ltd.: *See—*
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Toyoda, Sadao: *See—*
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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Niimi, Itaru; Hashimoto, Kametaro; Ushitani, Kenji; Serino, Yoichi; Suganuma, Tetsuya; Mitani, Seishu; and Imanishi, Kunizo, 3,863,318.
Niimi, Itaru; Kaneko, Yasuhisa; Morita, Akiyoshi; Yagi, Katumi; and Kashiwagi, Hiromitu, 3,863,701.
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Yamanaka, Teruo; Kato, Takayuki; Ozeki, Osamu; Sato, Kazuo; and Bito, Minoru, 3,864,678.

Tracey, Robert J.; and Lombaerde, Robert P., to Lynch Communication Systems, Inc. Receiver for decoding duobinary signals. 3,864,529. Cl. 178-69.50R.

Tractel S. A.: *See—*
Cavalieri, Michel, 3,863,893.

Tramontini, Vernon N., to Stewart-Warner Corporation. Heat exchanger. 3,863,713. Cl. 165-158.000.

Trans-Continental Purification Research and Development Ltd.: *See—*
Morin, Albert Z.; and Boyd, Thomas H., 3,864,252.

Transfer Systems Incorporated: *See—*
Jones, Cecil R., 3,863,995.

Trask, R. Pierce, II, to United States of America, Army. Apparatus for measuring the diameter for through holes. 3,863,492. Cl. 73-37.500.

Traub GmbH: *See—*
Wiesner, Franz, 3,863,528.

Trautman, Herbert C.: *See—*
Cauffiel, Ford B.; and Trautman, Herbert C., 3,863,858.

Trebinger, Karl: *See—*
Reinhardt, Helmut; Trebinger, Karl; and Kallrath, Gottfried, 3,864,453.

Tredway, Wynn B. Game club swing training device. 3,863,933. Cl. 273-186.00A.

Trestman, Robert: *See—*
Loeb, David C.; and Trestman, Robert, 3,863,503.

Treuer, Allan J. Flake ice producing machine. 3,863,462. Cl. 62-345.000.

Trezise, Richard Dale, to Singer Company, The. Shift lock mechanism. 3,863,748. Cl. 197-107.000.

Trichet, Jean; Simonet, Guy; and Guellaff, Jean-Pierre, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude. Process for obtaining deuterium. 3,864,466. Cl. 423-648.000.

Trippel, Karl: *See—*
Meier, Arnold; and Trippel, Karl, 3,863,547.

Trotel, Jacques, to Thomson-CSF. Device for increasing the accuracy of addressing an electron beam striking a target. 3,864,597. Cl. 315-31.00R.

Trott, W. James; and Zalesak, Joseph F., to United States of America, Navy. Line hydrophone array element calibrator. 3,864,664. Cl. 340-5.00C.

Trowe, Neil M.: *See—*
Stillman, Irving M.; Trowe, Neil M.; and Clemens, Jules R., 3,864,571.

Trueblood, Jon H.; Rossomondo, Roger M.; and Carlton, William H., to Medical College of Georgia Foundation Inc. Method for microscintigraphic evaluation studies. 3,863,623. Cl. 128-2.00A.

Trumbo, Cecil Dale. Wire tie device. 3,863,558. Cl. 100-33.000.

Trumbore, Forrest A.: *See—*
Broadhead, John; Di Salvo, Francis Joseph, Jr.; and Trumbore, Forrest A., 3,864,167.

TRW Inc.: *See—*
Becker, Charles Henry, 3,863,300.
White, Hollis N., Jr., 3,863,449.

Tso, Tien C., to United States of America, Agriculture. Process for treating tobacco. 3,863,645. Cl. 131-17.00R.

Tsubakimoto Chain Co.: *See—*
Murata, Tsuneo, 3,863,777.

Tsubouchi, Kuniyoshi: *See—*
Yasugahira, Norio; Tsubouchi, Kuniyoshi; Sato, Takeshi; and Uenishi, Akira, 3,863,608.

Tsuji, Hitoshi; Murayama, Takeshi; Kawahata, Shigeo; Komine, Isamu; Huziwara, Satoshi; and Ueki, Mikio, to Nippon Kokan Kabushiki Kaisha. Apparatus for drawing wires and tubes. 3,863,484. Cl. 72-274.000.

Tsuji, Takaakira: *See—*
Ohno, Koji; Tsuji, Takaakira; and Takeuchi, Nobusuke, 3,864,315.

Tsukamoto, Kunio: *See—*
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Tsunekawa, Tokuichi; and Nakamoto, Soichi, to Canon Kabushiki Kaisha. Automatic exposure control system for ttl metering type single-lens reflex camera. 3,864,699. Cl. 354-31.000.

Tsutsui, Nobuhiro: *See—*
Sekiguchi, Hideto; Tsutsui, Nobuhiro; and Sumi, Takehiko, 3,864,447.

Tubbs, Duane: *See—*
Walters, Glenn A.; VonKline, Edward E.; and Tubbs, Duane, 3,864,687.

Tuckett, William F., and Peterson, Ivan A., to Phillips Petroleum Company. Dehydration of gases. 3,864,103. Cl. 55-32.000.

Tunjic, Peter. Lift up garage doors. 3,863,389. Cl. 49-205.000.

Turba, Werner: *See—*
Adler, Klaus; Bauer, Johann; Englbrecht, Rupert; Turba, Werner; Pichler, Englbert; and Maluschka, Adolf, 3,864,432.

Turbak, Albin F., to Tee-Pak, Inc. Adjuvent containing polymeric sausage casing and method of preparation. 3,864,499. Cl. 426-138.000.

Turjanica, Michael: *See—*
Forbes, Ronald G.; and Turjanica, Michael, 3,864,273.

Turner, Alison: *See—*
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Tuschiya, Takashi: *See—*
Inoue, Michiro; Ishikawa, Masayuki; Tuschiya, Takashi; and Shimamoto, Takio, 3,864,343.

Tyssee, Donald Armon, to Monsanto Company. Electrolytic Carboxylation of Substituted Olefins. 3,864,225. Cl. 204-59.00R.

Uchida Sharyo Co., Ltd.: *See—*
Uchida, Suekichi, 3,863,698.

Uchida, Shunichiro: *See—*
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Uchikawa, Hiroshi; and Uchida, Shunichiro, 3,864,141.

Uchida, Suekichi, to Uchida Sharyo Co., Ltd. Chair with a detachable seat. 3,863,698. Cl. 160-327.000.

Uchikawa, Hiroshi; and Uchida, Shunichiro, to Onoda Cement Company, Limited. Process for regulating setting time of hydraulic cement. 3,864,138. Cl. 106-89.000.

Uchikawa, Hiroshi; and Uchida, Shunichiro, to Onoda Cement Company, Limited. Process for regulating setting time of hydraulic cement. 3,864,141. Cl. 106-315.000.

Ueda, Hirozo; Shiba, Keisuke; and Sato, Akira, to Fuji Photo Film Co., Ltd. Silver bromoiodide photographic emulsion with improved green sensitivity. 3,864,134. Cl. 96-124.000.

Ueki, Mikio: *See—*
Tsuji, Hitoshi; Murayama, Takeshi; Kawahata, Shigeo; Komine, Isamu; Huziwara, Satoshi; and Ueki, Mikio, 3,863,484.

Uematsu, Shigeyuki; and Abe, Haruhiko, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor devices having negative resistance and stepped voltage-to-current characteristics. 3,864,719. Cl. 357-4.000.

Uemura, Yasuhiro, to Teac Corporation. Apparatus for detecting the loading of a cassette on a cassette tape deck. 3,864,744. Cl. 360-96.000.

Uenishi, Akira: *See—*
Yasugahira, Norio; Tsubouchi, Kuniyoshi; Sato, Takeshi; and Uenishi, Akira, 3,863,608.

Ueno, Kunimitsu, to Kabushiki Kaisha Komatsu Seisakusho. Device for sinking and retrieving underwater heavy article. 3,863,458. Cl. 61-69.00R.

Uhing, Eugene H.: *See—*
Via, Francis A.; Uhing, Eugene H.; and Toy, Arthur D. F., 3,864,394.

Ulyanova, Olga Vasilievna: *See—*
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Umeda, Hiroyuki, to Victor Company of Japan, Ltd. Endless magnetic tape cartridge. 3,863,853. Cl. 242-55.19A.

Umeno, Masashi; Ichikawa, Mitsuo; Takeuchi, Yasumasa; and Shiratsuchi, Eiichiro, to Japan Synthetic Rubber Co., Ltd. Rubber Compositions Containing Cis-Polybutadiene and 1,2-Polybutadiene. 3,864,430. Cl. 260-894.000.

Unger, Richard A. Pipe smoking. 3,863,647. Cl. 131-179.000.

Union Carbide Corporation: *See—*
Baird, Robert J.; and Everett, Thomas G., Jr., 3,864,150.
Critchfield, Frank E.; and Koleske, Joseph V., 3,864,434.
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Agriculture: *See—*
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Dosch, Robert G.; and Prevender, Thomas S., 3,864,219.
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Russell, James T., 3,864,043.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Dillon, Robert F., Jr.; and Mayne, Robert C. Shock absorbing mount for electrical components. 3,863,881, Cl. 248-358.00R.
Iceland, William F.; and Whiffen, Edwin L. Grain refinement control in tig arc welding. 3,864,542, Cl. 219-137.000.
Shima, Rindge. Multitarget sequential sputtering apparatus. 3,864,239, Cl. 204-298.000.
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Hall, John B., Jr.; and Williams, Edwin F., 3,864,060.
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Brinker, Francis R.; Roeschlfin, Eugene R.; and Zeph, David L., 3,864,555.
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Wesselink, Gustaaf Adolf; Bleckrode, Richard; Roelofs, Hendrik; and Broerse, Pieter Hendrik, 3,864,599.
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Nelson, Norman A., 3,864,387.
Urano, Fumio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Multiple exposure structure for cameras. 3,864,706, Cl. 354-209.000.
Urban, Peter, to Universal Oil Products Company. Process for converting cellulose. 3,864,096, Cl. 44-50.000.
Urban, Peter, to Universal Oil Products Company. Process for converting cellulose. 3,864,097, Cl. 44-50.000.
Ushitani, Kenji: *See—*
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Utter, Robert P.; and Kohl, Vance L., to King-Seeley Thermos Co. Ice making apparatus. 3,863,463, Cl. 62-354.000.
Uvanni, Joseph R. Weighted chess piece. 3,863,930, Cl. 273-137.00W.
V-Mark Automation Ltd.: *See—*
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Vachon, Bertrand. Hydraulic wheel. 3,863,548, Cl. 91-495.000.
Vahlensieck, Hans-Joachim: *See—*
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Vaiano, Vincent. Automatic hair washer, conditioner and dryer combination. 3,863,651, Cl. 132-9.000.
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Valcic, Albino. Cigarette dispenser with swivel acting ejector. 3,863,803, Cl. 221-210.000.
van Amerongen, Edward, to Respiratory Care, Inc. Electric heating unit for liquid. 3,864,544, Cl. 219-301.000.
van Amerongen, Gerrit J.: *See—*
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Van Bennekom, Hans Lochmann, to Burroughs Corporation. Bursting, Separating and/or Die Cutting Apparatus for Continuous Forms. 3,863,821, Cl. 225-93.000.
Van Bonin, Wulf; Nehen, Ulrich; and Von Gizycki, Ulrich, to Bayer Aktiengesellschaft. Hydrogen peroxide blowing agent for silicate foams. 3,864,137, Cl. 106-75.000.
Vancil, Rayburn D., to Olin Corporation. Rotary connection for a safety bag inflation system. 3,863,948, Cl. 280-150.0AB.
Van Der Houven Van Oordt, Adriaan Julius: *See—*
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van der Mast, Karel Diederick; and Barth, James Edmond, to U.S. Philips Corporation. Electron beam apparatus comprising a point cathode. 3,864,572, Cl. 250-306.000.
Van Der Plaats, Petrie Johan; and Van Zuuren, Eduard Willem, to U.S. Philips Corporation. Tone ringer with a negative impedance amplifier. 3,864,532, Cl. 179-84.00T.
Vanderveen, John W., to Phillips Petroleum Company. Carbon black structure reduction using a uranium additive. 3,864,455, Cl. 423-450.000.
van de Vaart, Herman; Matthews, Hugh B.; and Worley, James C., to Sperry Rand Corporation. Acoustic delay surface wave motion transducers. 3,863,497, Cl. 73-71.200.
Van Doorn, Rudolf Alexander: *See—*
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Van Huisen, Allen T., to Watase, Kinichi. Geothermal-nuclear waste disposal and conversion system. 3,864,208, Cl. 176-39.000.
Van Lake, Carmen J., to United States Steel Corporation. Flat wire conveyor belt with improved covering. 3,863,754, Cl. 198-195.000.
Van Paesschen, August Jean; Van Gossum, Lucien Janbaptist; and Priem, Jan Jozef, to Agfa-Gevaert. Electrophotographic sheet material employing a hydrophobic film support and hydrophilic layer. 3,864,128, Cl. 96-1.800.
Van Regenmortel, Ludovicus Carolus, to Agfa-Gevaert. Adjustable coating pan. 3,863,600, Cl. 118-419.000.
Van Tassell, Harry M., to Universal Oil Products Company. Solvent extraction with internal preparation of stripping steam. 3,864,244, Cl. 208-321.000.
Van Tassell, Harry M., to Universal Oil Products Company. Solvent extraction with increased polar hydrocarbon purity. 3,864,245, Cl. 208-321.000.
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Varner, Reed W. Selective tropical crop herbicides. 3,864,116, Cl. 71-92.000.
Vasilantone, Michael. Expander, device for stretching a fabric sheet. 3,863,368, Cl. 38-102.500.
Vaughan, Thomas J.; and Hickey, Richard A. Coaxial transfer switch. 3,864,536, Cl. 200-37.00A.
Vaught, Alvin C., to du Pont de Nemours, E. I., and Company. Recovery of dicyanobutene from dicyanobutene process brine. 3,864,381, Cl. 260-465.80R.
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Vega, Raul Antonio. Dismountable column applicable to automatic record players. 3,863,934, Cl. 274-10.00S.
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Vignon, Louis, to Heberlein Hispano S.A. Feeding devices for textile machines. 3,863,751, Cl. 198-27.000.

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Viniczay, Gabriella Fuchs; Hutter, Wilhelm; and Bohme, Rudolf-Karl, to Aktiengesellshaft Adolf Saurer. Phase angle measuring arrangement. 3,864,040, Cl. 356-24.000.

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Von Fummetti, Cy William; and Latham, David Dennis, to Deere & Company. Engine compartment side shield structure. 3,863,729, Cl. 180-69.00R.

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Wagner, Dale R., to AMF Incorporated. Baking pan registration control system. 3,863,422, Cl. 53-55.000.

Wahlquist, Carl D., to Building Components Research, Inc. Building Construction. 3,863,404, Cl. 52-27.000.

Wakamatsu, Hisato; Ando, Noriyoshi; and Majima, Kazu, to Nippon Denso Company Limited. Anti-skid control device for vehicles with clutch releasing. 3,863,730, Cl. 180-82.00R.

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Walker, Neil Edward, to Electronic Communications, Inc. Asynchronous multiplexing of digitized speech. 3,864,524, Cl. 179-15.0BA.

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Walters, Glenn A.; VonKline, Edward E.; and Tubbs, Duane, to Cubic Corporation. Coaxial horn antenna. 3,864,687, Cl. 343-778.000.

Wang, Ching C.; Mata, Justo Martinez; and Hernandez, Sebastian. Cinerubin A and B As Antiparasitic Agents. 3,864,480, Cl. 424-120.000.

Warax, Earnest R. Overhead duct and pipe support. 3,863,910, Cl. 269-11.000.

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Watson, Charles Andrew, to Lever Brothers Company. Visually clear toothpaste containing a synthetic precipitated hydrated silica. 3,864,470, Cl. 424-49.000.

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Webb, Wells A. Load supporting pallet. 3,863,784, Cl. 214-10.50R.

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LIST OF DEFENSIVE PUBLICATIONS

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Carr, Ethbert S., Jr., and G. P. Morie. Method of monitoring plasticizer concentration in filter tow by measuring fluorescence intensity. T931,005, 2–4–75, Cl. 250—302.

Du Pont de Nemours, E. I., and Co.: *See*—
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Firestone Tire & Rubber Co., The: *See*—
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Fryd, Michael, and A. R. Krueger. Polymeric soaps. T931,002, 2–4–75, Cl. 260—79.30.

Hercules Inc.: *See*—
Klug, Eugene D. T931,004.

Klug, Eugene D., to Hercules Inc. Reconstituted tobacco. T931,004, 2–4–75, Cl. 131—17.

Krueger, Achim R.: *See*—
Fryd, Michael, and Krueger. T931,002.

Laman, Joseph R., to The Firestone Tire & Rubber Co. Sound-attenuating coatings and coated products. T931,006, 2–4–75, Cl. 117—132.

Morie, Gerald P.: *See*—
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O'Neal, Grady M.: *See*—
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Reife, Abraham, and G. M. O'Neal. Process of dyeing using monoazo disperse dyes. T931,001, 2–4–75, Cl. 8—21.

Wilkinson, William K., to E. I. du Pont de Nemours and Co. Dry spinning process. T931,002, 2–4–75. Cl. 264—206.

LIST OF REISSUE PATENTEES

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Milligan, Gene E. to NCR Corp. Self-clocking five bit record-playback system. Re. 28,330, 2–4–75, Cl. 360—48.

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ISSUED FEBRUARY 4, 1975

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9R 3,863,280
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191 3,863,293

CLASS 17
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CLASS 19
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CLASS 21
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CLASS 23
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230R 3,864,082
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253R 3,864,086
3,864,087
258.5 3,864,089
267E 3,864,090
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71J 3,863,299
73BC 3,863,300
85R 3,863,301
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230.5SS 3,863,305
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CLASS 29
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571 3,863,330
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42.28 3,863,378
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CLASS 46
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CLASS 47
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56 3,863,388

CLASS 48
73 3,864,100

CLASS 49
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360 3,863,390
382 3,863,391

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9 3,863,393
109R 3,863,394
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CLASS 66
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67.8S 3,863,496
71.2 3,863,497
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194B 3,863,500
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242.16 3,863,517
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CLASS 140

93.4 3,863,684

CLASS 141

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CLASS 145

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CLASS 172

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60 3,864,210
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CLASS 188

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CLASS 192

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CLASS 203

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CLASS 204

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CLASS 206

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250 3,863,760
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CLASS 208

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321 3,864,244
3,864,245

CLASS 209

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111.8 3,863,764
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469 3,863,766

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63 3,864,254
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62R 3,863,781
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301 3,863,798

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CLASS 221

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531 3,863,818
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DESIGN PATENTS

6 : 234,237	234,261	234,274	25 : 234,252	36 : 234,233	40 : 234,242
234,246	234,268	13 : 234,236	26 : 234,238	234,244	42 : 234,265
234,247	234,271	17 : 234,251	27 : 234,245	234,260	47 : 234,239
234,248	9 : 234,258	234,253	31 : 234,262	234,269	55 : 234,249
234,255	12 : 234,235	18 : 234,259	34 : 234,254	37 : 234,266	234,250
234,257	234,243	21 : 234,234	234,273	234,267	

PLANT PATENTS

6 : 3,678	3,679	3,680	12 : 3,681		

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

10 : T931004	34 : T931001	39 : T931006	42 : T931003	47 : T931005	51 : T931002

U. S. GOVERNMENT PRINTING OFFICE : O - 1975

U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, *Secretary*

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*